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DENVER, COLORADO

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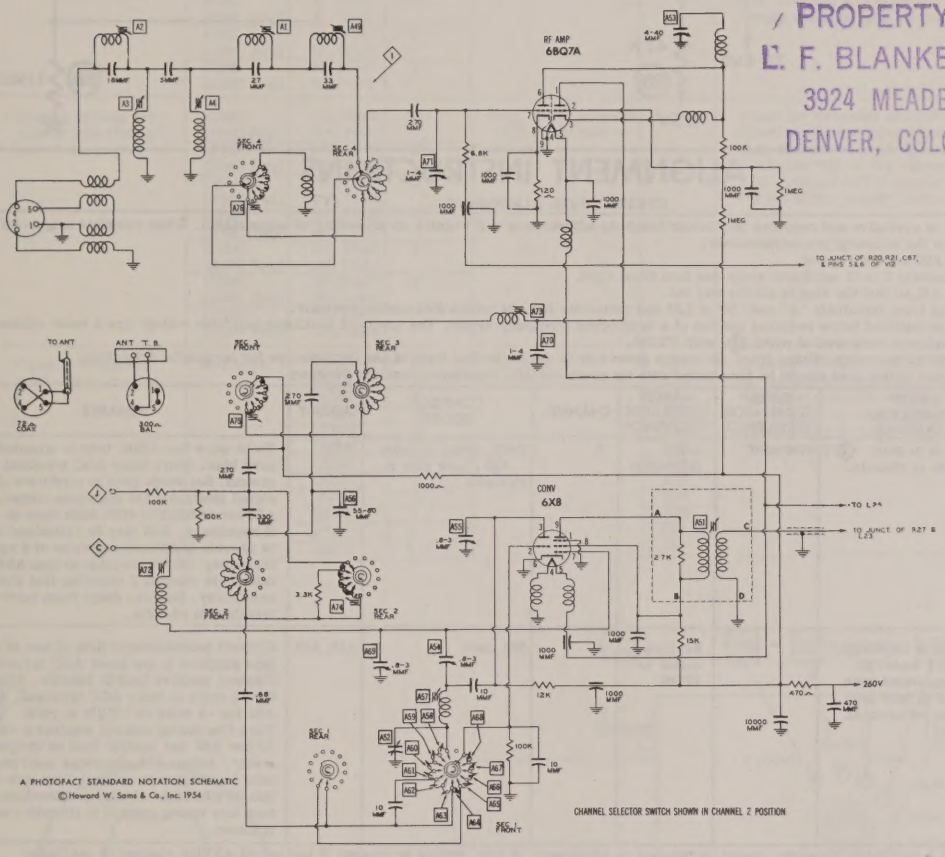
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 207

Ch. KCS82, B

RCA Victor Models 21-T-303, U, 21-T-313, U, 21-T-314, U, 21-T-315, U, 21-T-316, U, 21-T-322, U, 21-T-323, U and 21-T-324, U (Ch. KCS82, B) are covered in Photofact Folder 7 - Set 207. Models 21-T-313G, GU and 21-T-314G, GU have now been added. These models are identical to models 21-T-313, U and 21-T-314, U, respectively, except a 21EP4 glass picture tube is used.

Ch. KCS82A

Chassis KCS82A is used in later production of models 21-T-303, 21-T-313, G, 21-T-314, G, 21-T-315, 21-T-316, 21-T-322, 21-T-323 and 21-T-324. Chassis KCS82A is identical to chassis KCS82, except the KRK-22A tuner is used. A schematic of this tuner is given below. Alignment instructions are given on the reverse side.



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Ch. KCS82, A, B

In later production of Ch. KCS82, A, B the following changes were made.

The video output screen resistor, R44, was changed from 5.6KΩ to 8.2KΩ.

R126 was omitted in some receivers.

The first and second video IF amplifiers (V3 and V4) were changed to type 6CF6 tubes. No circuit changes were made when this change was made.

The sync amplifier and vertical multivibrator tube (V14) was changed from a type 12AU7 to a 6SN7GT tube. A partial schematic is given on the reverse side which shows the new circuit when the 6SN7GT tube is used.

RCA VICTOR MODELS 21-T-303(Ch. KCS82, A), 21-T-303U(Ch. KCS82B), 21-T-313, G(Ch. KCS82, A), 21-T-313GU, U(Ch. KCS82B) 21-T-314, G(Ch. KCS82, A) 21-G-314GU, U(Ch. KCS82B), 21-T-315(Ch. KCS82, A), 21-T-315U(Ch. KCS82B), 21-T-316(Ch. KCS82, A), 21-T-316U(Ch. KCS82B), 21-T-322(Ch. KCS82, A), 21-T-322U (Ch. KCS82B), 21-T-323(Ch. KCS82, A), 21-T-323U(Ch. KCS82B), 21-T-324(Ch. KCS82, A), 21-T-324U(Ch. KCS82B).

PRODUCTION CHANGES
BULLETIN 110

PRODUCTION CHANGES
BULLETIN 110

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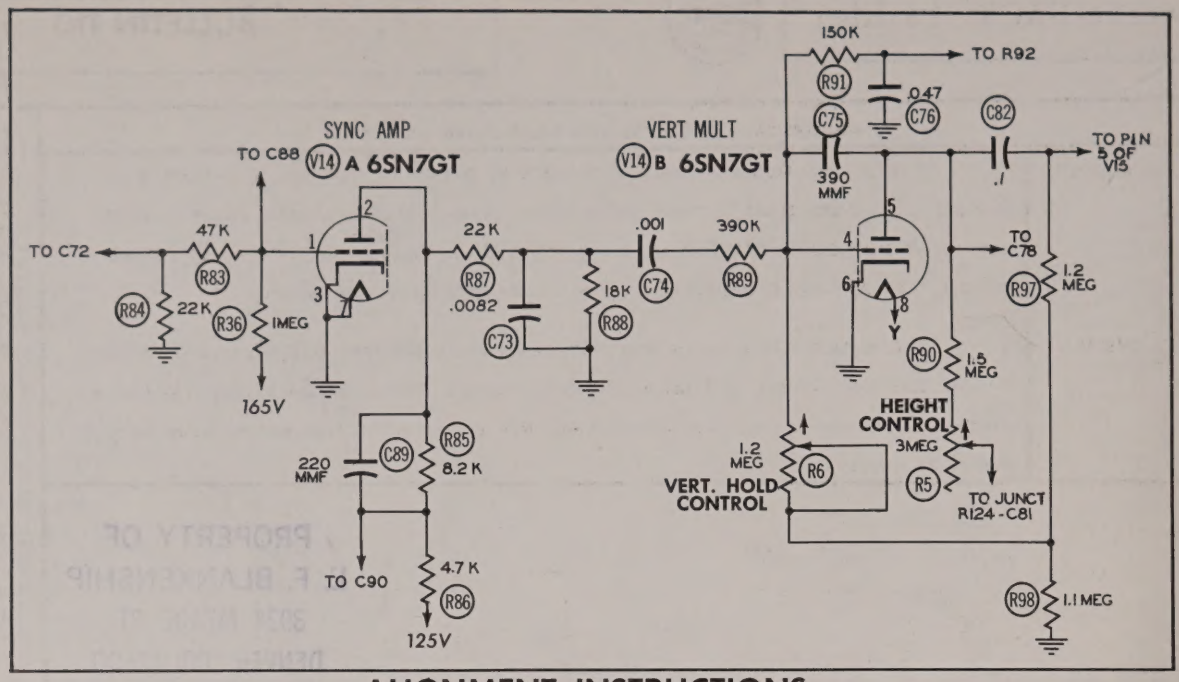


ALIGNMENT INSTRUCTIONS

KRK22A TUNER ALIGNMENT

An RF unit which is operative and requires only minor touch-up adjustments will require no presetting of adjustments. When complete alignment is necessary make the following pre-adjustments:

1. Preset A52 all the way out.
2. Set channels 7 to 13 oscillator slugs one turn from tight.
3. Adjust A51 so that the slug is all the way out.

Disconnect the link from terminals "A" and "B" of L23 and terminate the link with a 39Ω carbon resistor.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter. The limits of oscillator injection voltage are 2 volts minimum and 5.5 volts maximum measured at point ◇J with VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
43.	Direct	High side to point ◇J. Low side to chassis.	Not used	42MC (400∿Mod)	2	Vert. Amp. to point ◇J. Low side to chassis.	A53	To be sure that 42MC trap is adjusted with zero bias. Short tuner AGC terminal to ground. Set scope gain to maximum. Adjust signal generator for maximum output. Adjust A53 for MINIMUM 400∿ indication on scope. If necessary, A53 may be retouched in field to provide additional rejection at a specific frequency. Exercise care so that A53 is not tuned into channel 2 reducing that channel's sensitivity. Remove short from tuner AGC terminal to chassis.
44.		RF input of heterodyne frequency meter to end of insulated wire inserted in hole provided for adjustment of A55.	"	Set freq. meter to 227MC	8	Not used	A55, A52	Connect potentiometer arm of one of the bias supplies to the tuner AGC terminal. Connect positive lead to chassis. Adjust for -3 volts at tuner AGC terminal. Preset A53 for -3 volts on VTVM at point ◇J. Turn fine tuning control maximum clockwise Adjust A55 for audible beat on frequency meter. Adjust A52 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mid-range position.

NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A55, switch to channel 13 and adjust A57 for channel 13 oscillator frequency, then switch to channel 12 and adjust A58 for channel 12 oscillator frequency. Continue down to channel 8 adjusting proper oscillator trimmer to obtain proper oscillator frequency on each channel. Also, on channel 8, adjust A55 for channel 8 oscillator frequency. Switch to channel 13 and adjust A58, then switch back to channel 8 and adjust A55 again.

45.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point ◇J. Low side to chassis.	A69,A56, A70,A71	Set A51 fully counter clockwise. Set the scope gain to maximum and attenuate generator output for minimum input signal that will produce usable pattern on scope. Adjust for response similar to Fig. 9. Adjust A71 for maximum amplitude between markers. A70 affects pass band. A69 affects tilt (when A71 is properly adjusted). A56 affects the response band width.
46.	Connect the DC probe of VTVM to point ◇J. Common to chassis. Adjust A54 for -3 volts at point ◇J. Repeat steps 45 and 46 until proper response is obtained.							
47.		Connect frequency meter as in step 44.	Not used	Freq. meter to 257MC	13	Not used	A57	Rotate fine tuning control maximum clockwise. Adjust A57 for audible beat on freq. meter. SLIGHTLY overshoot the adjustment an additional turn in the same direction, then adjust A52 to again obtain an audible beat.
48.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point ◇J. Low side to chassis.	A72 A73	Adjust for response similar to Fig. 9. Turn off generator and check oscillator injection voltage at point ◇J using VTVM as in step 46. If A54 required readjustment, turn sweep generator back on and recheck channel 13 response. If necessary, retouch A72 and A73 for desired response.

(Continued on next page)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
49.		Connect frequency meter as in step 44.	Not used	Freq. meter to 227MC	8	Not used	A52	Check for audible beat on freq. meter. If necessary, adjust A52 for proper oscillator frequency.
50.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point ⓙ. Low side to chassis.	A69, A56, A70, A71	If necessary, retouch A69, A56, A70 and A71 to obtain response similar to Fig. 9. If A69 required adjustment turn off generator and switch back to channel 13 and check oscillator injection voltage as in step 46. If necessary, repeat steps 48, 49 and 50 until proper response is obtained.
51.		Connect frequency meter as in step 44.	Not used	Freq. meter to 129MC	6	Not used	A64	Set fine tuning control to its mid-range position. Adjust A64 for audible beat on frequency meter.
52.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point ⓙ. Low side to chassis.	A74, A75 A76	Adjust for response curve similar to Fig. 9. Check oscillator injection voltage as in step 46. Readjust A54 if necessary.
53.	If A54 required adjustment, switch receiver and generator channel 8. Readjust A69 for response similar to Fig. 9. Recheck A52 and A55 for proper oscillator frequency as in step 44.							
54.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point ⓙ. Low side to chassis.		Check for response similar to Fig. 9. Check oscillator injection voltage for each channel at point ⓙ. If markers fall below 80% on any channel retouch A74, A75 and A76 to obtain response curves within proper limits.
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
55.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point ⓙ. Low side to chassis.		Check for response similar to Fig. 9. Check oscillator injection voltage for each channel at point ⓙ. If markers fall below 80% on any channel, retouch A56, A69 and A32 to obtain response curves within proper limits.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
56.		Connect frequency meter as in step 44.	Not used	257MC	13	Not used	A57	Adjust individual channel oscillator slug for audible beat on each channel. Recheck oscillator injection voltage on each channel at point ⓙ to verify that the voltage is within limits (2 volts minimum and 5.5 volts maximum.
				251MC	12		A58	
				245MC	11		A59	
				239MC	10		A60	
				233MC	9		A61	
				227MC	8		A62	
				221MC	7		A63	
				129MC	6		A64	
				123MC	5		A65	
				113MC	4		A66	
				107MC	3		A67	
				101MC	2		A68	

RCA VICTOR MODELS 21-T-303 (Ch. KCS82, A), 21-T-303U (Ch. KCS82B), 21-T-313, G (Ch. KCS82, A), 21-T-313GU, U (Ch. KCS82B), 21-T-314, G (Ch. KCS82, A), 21-G-314GU, U (Ch. KCS82B), 21-T-315 (Ch. KCS82, A), 21-T-315U (Ch. KCS82B), 21-T-316 (Ch. KCS82, A), 21-T-316U (Ch. KCS82B), 21-T-322 (Ch. KCS82, A), 21-T-322U (Ch. KCS82B), 21-T-323 (Ch. KCS82, A), 21-T-323U (Ch. KCS82B), 21-T-324 (Ch. KCS82, A), 21-T-324U (Ch. KCS82B)

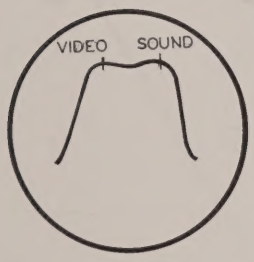
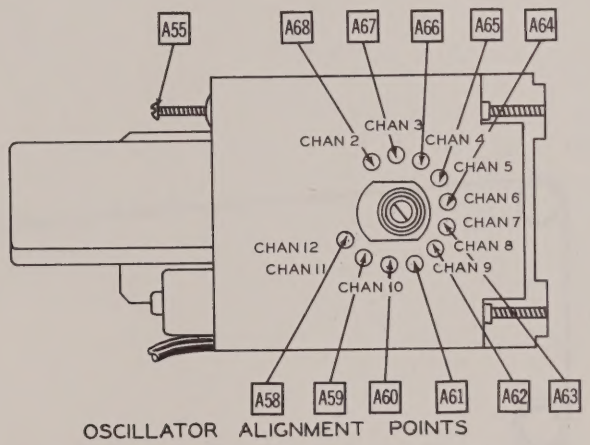


FIG. 9



OSCILLATOR ALIGNMENT POINTS

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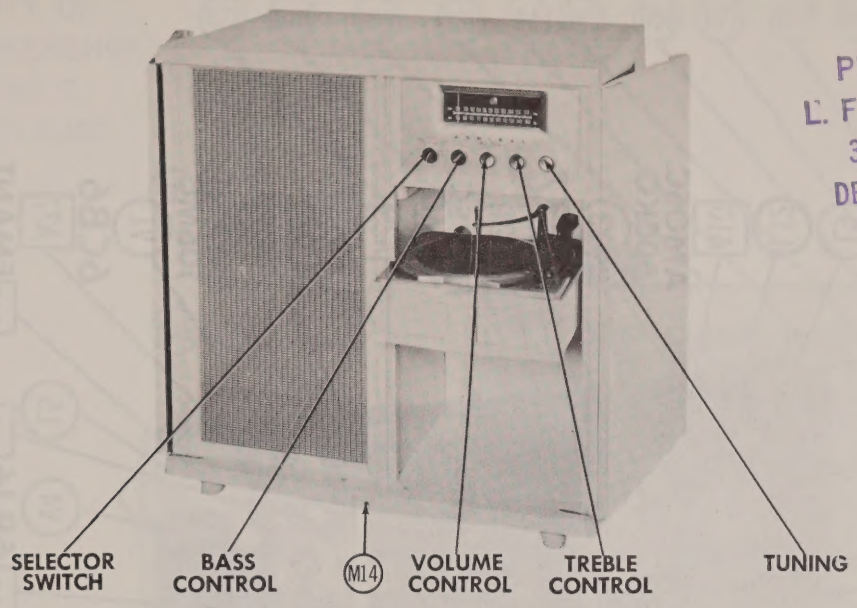
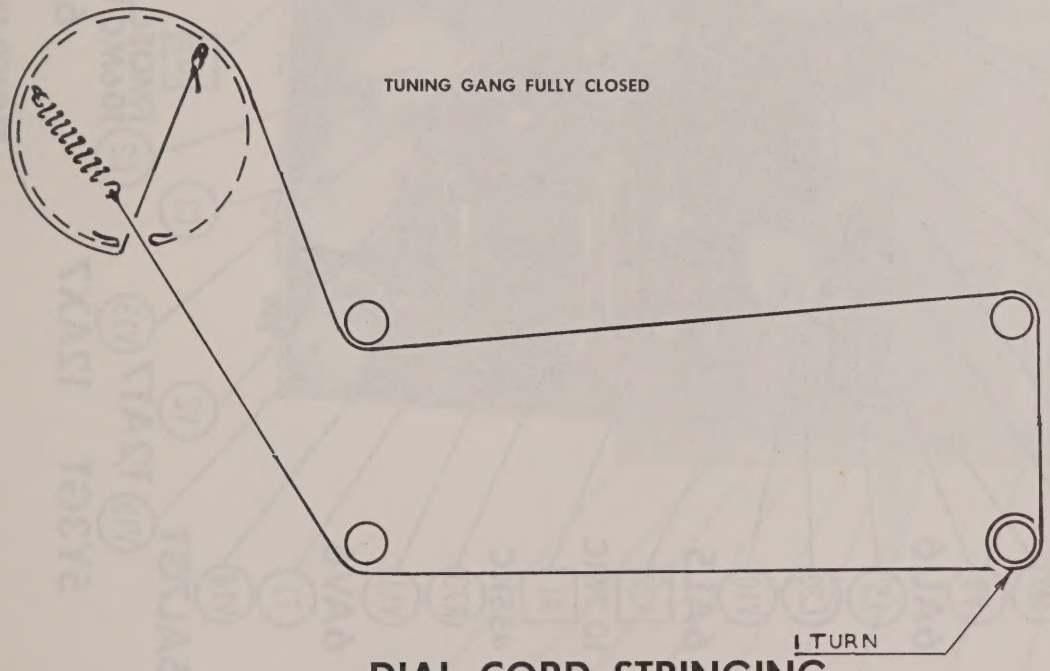
ADMIRAL
CHASSIS 15HF1, 4HF1, 1HF1



TRADE NAME	Admiral Models HiFi 6, HiFi 7, HiF 8 (Ch. 15HF1-Tuner, 4HF1-Amp., 1HF1 Power supply)		
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.		
TYPE SET	AC Operated AM-FM-Phono Combination Superheterodyne Receiver With 3 Speed Automatic Record Changer		
TUBES	Twenty (total)		
POWER SUPPLY	110-120 Volts AC-60 Cycles		RATING 1.82 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST		550-1700KC	FREQ. MOD. 88-108MC

RECORD CHANGER UNIT - ADMIRAL MODEL HI-FI RC600



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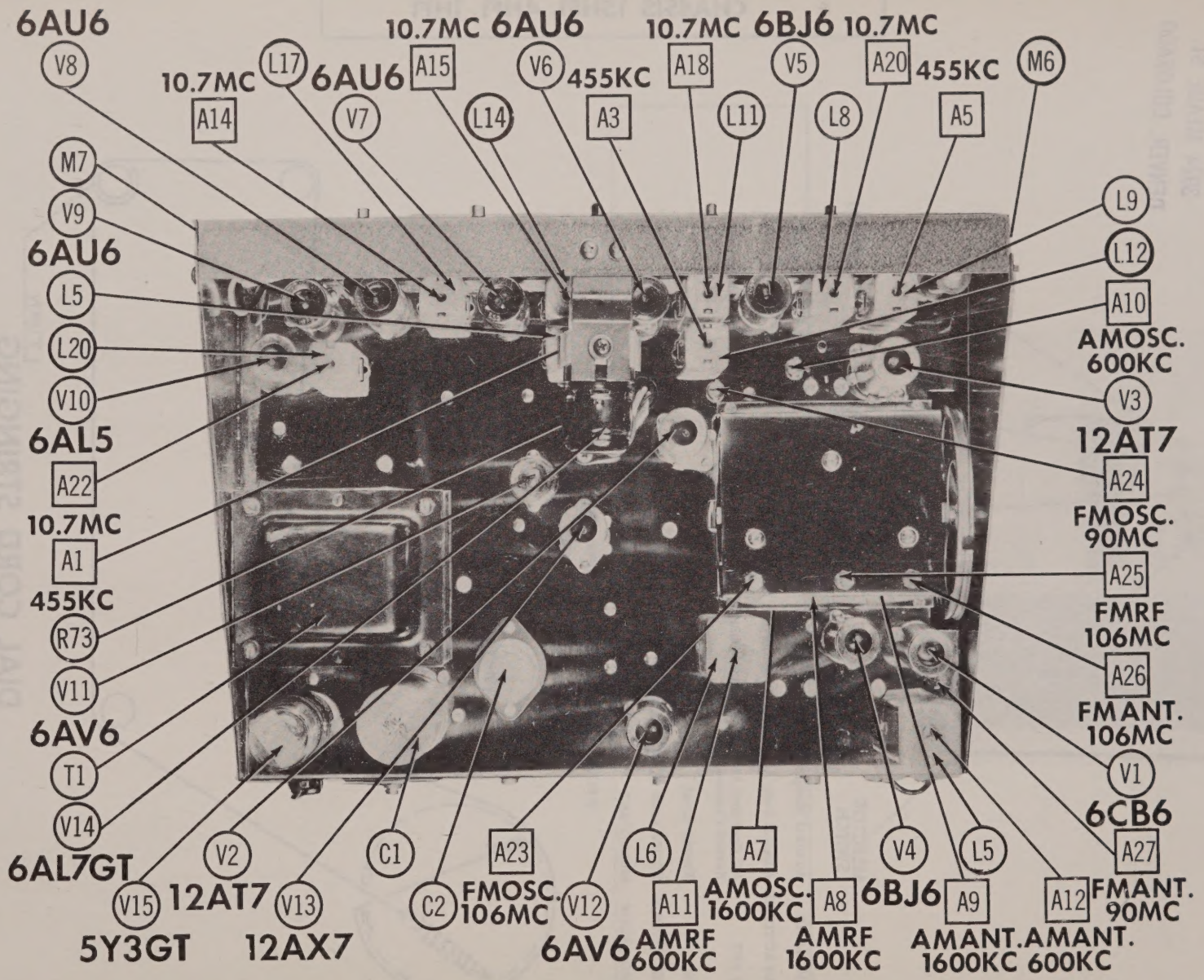
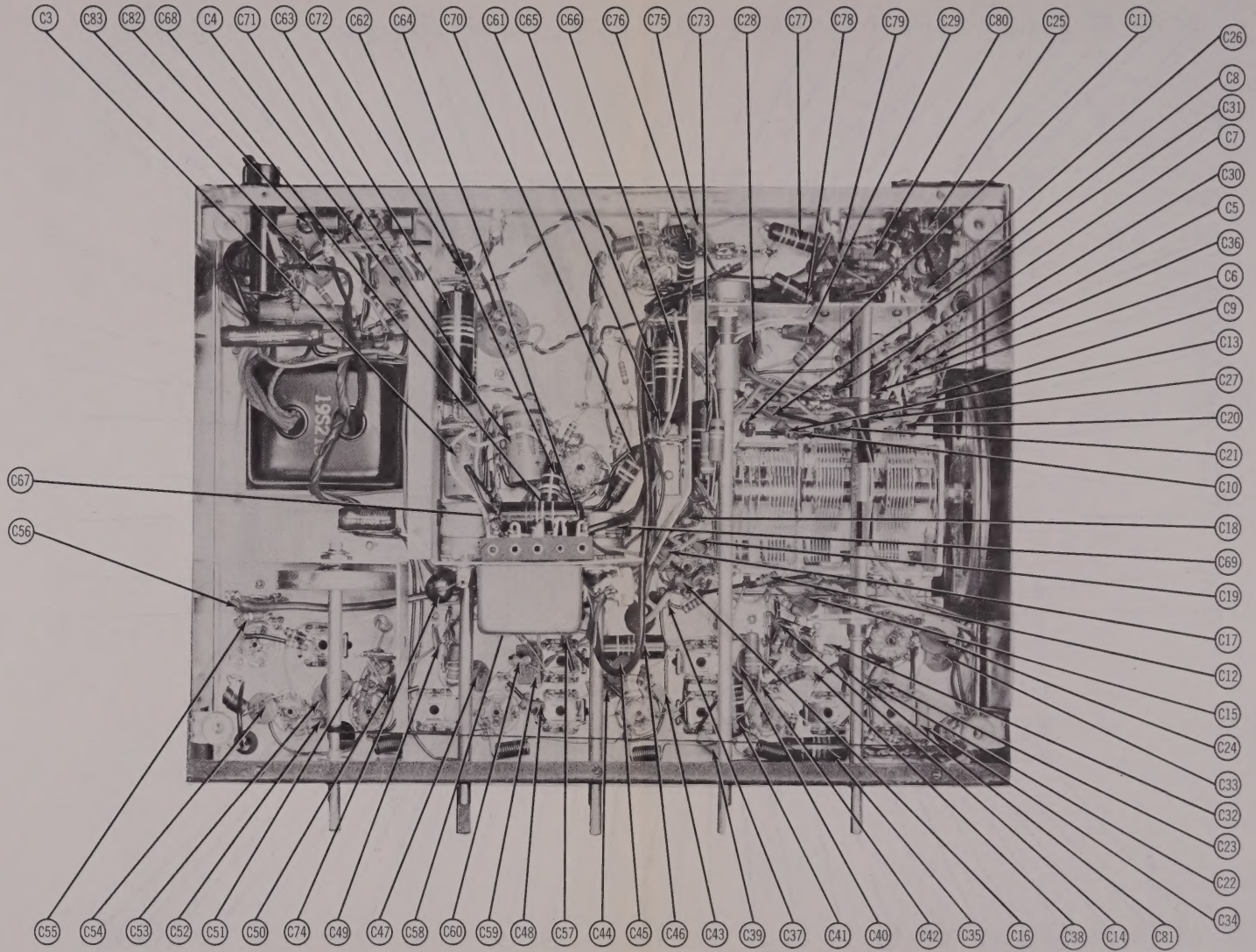


TUNER CHASSIS-TOP VIEW



TUNER CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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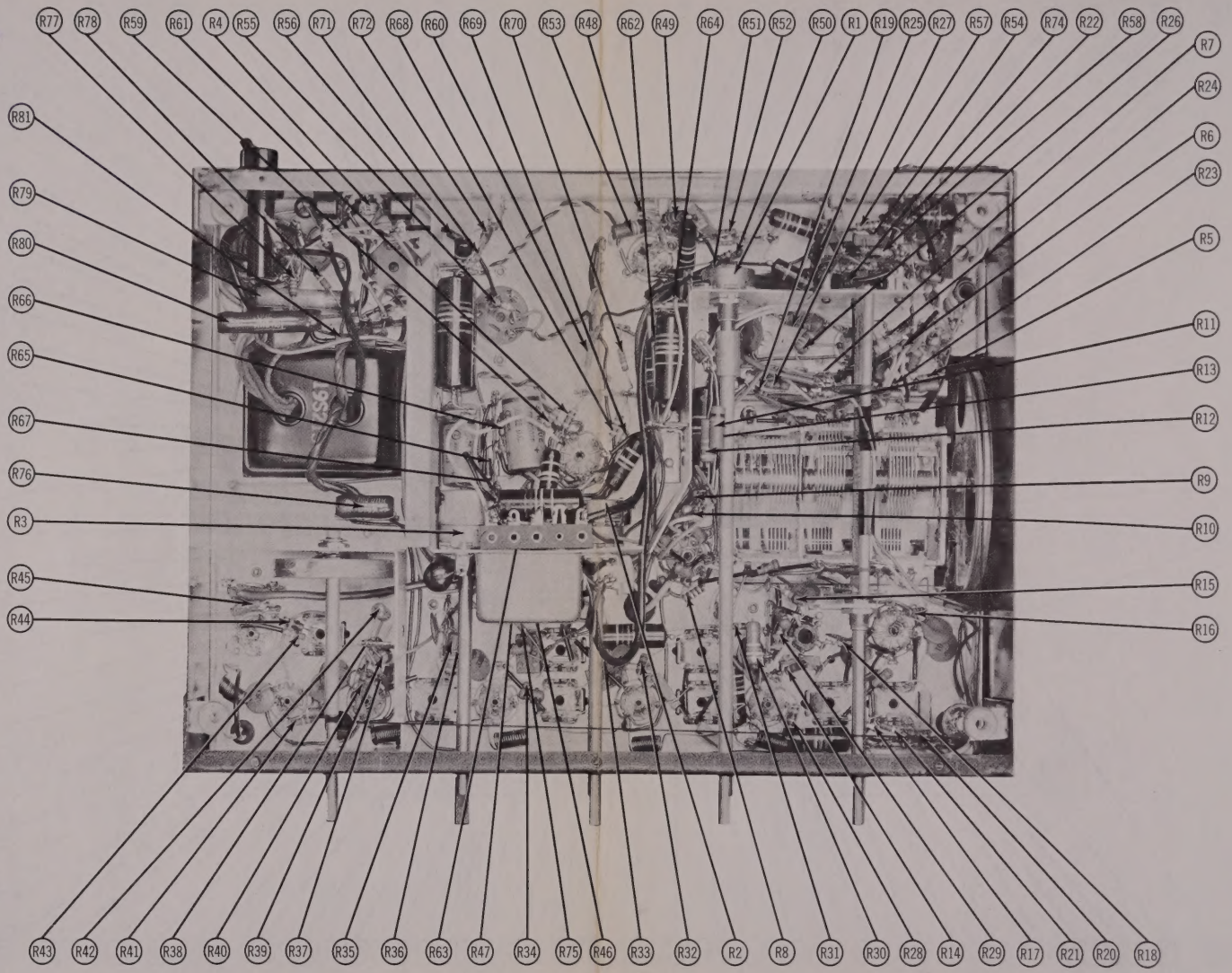

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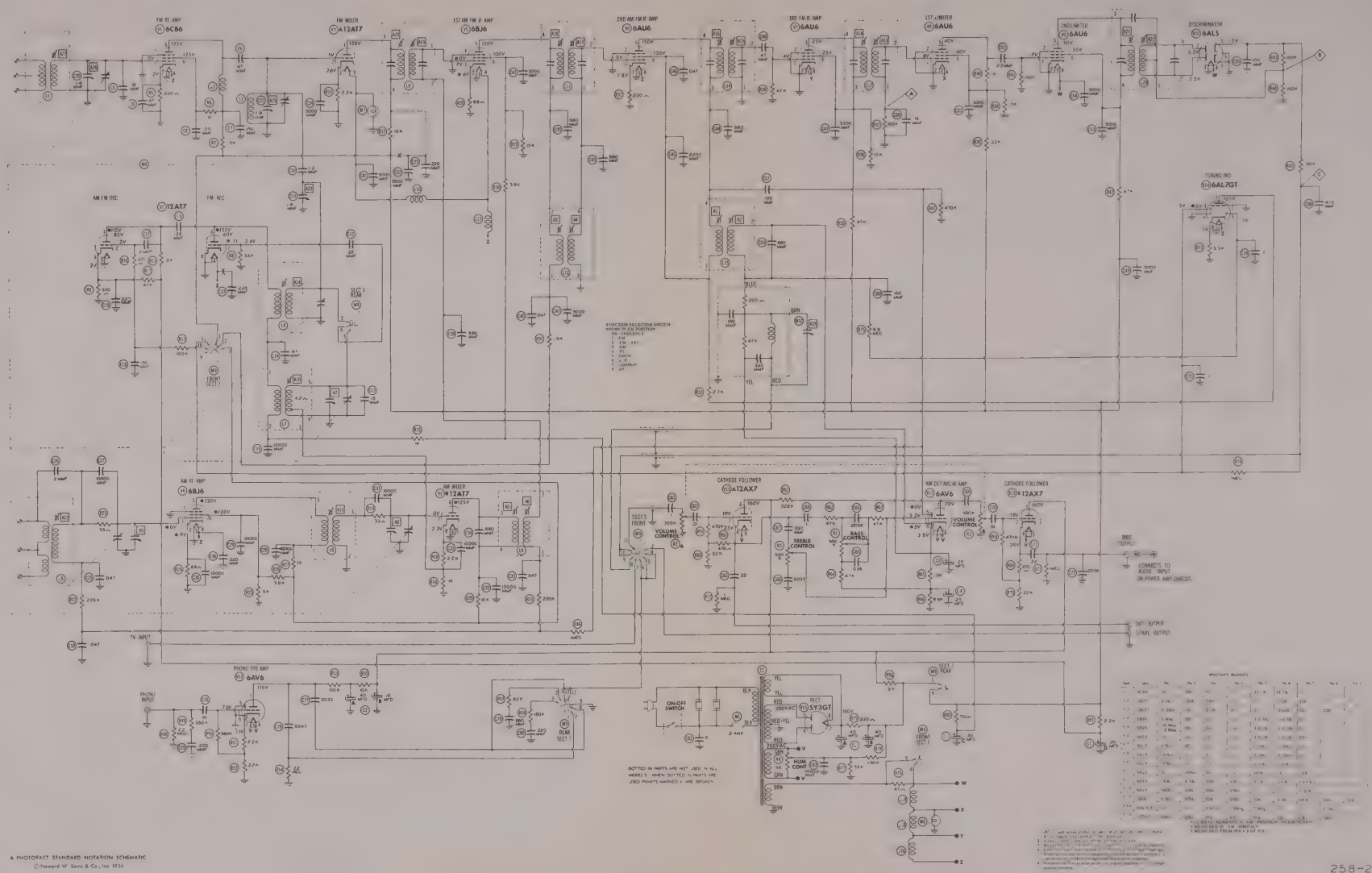
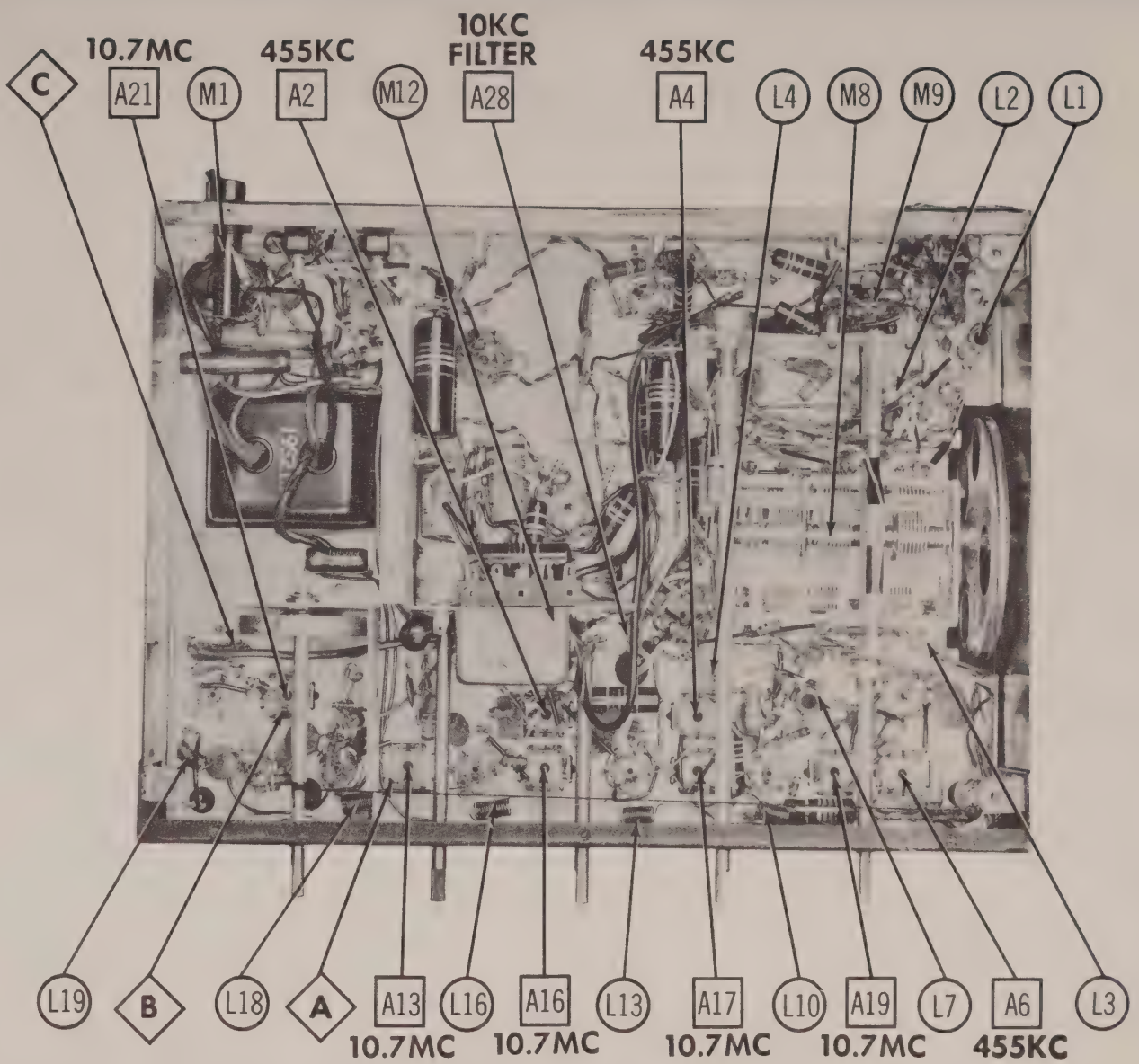


TUNER CHASSIS- SCHEMATIC



TUNER CHASSIS BOTTOM VIEW- ALIGNMENT IDENTIFICATION

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ADMIRAL
MODEL HIFI 6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow 15 minute warm up period for receiver and test equipment.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V3B). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4 A5, A6	Remove V2 and V4 from tube sockets. Adjust for maximum output. Replace V2 and V4 in their sockets.
2.	.01MFD	High side to "Lo" antenna terminal. Low side to chassis.	1600KC	"	1600KC	"	A7, A8	Adjust in order given for maximum output.
3.	"	"	600KC	"	600KC	"	A10, A11 A12	Adjust in order given for maximum output. Repeat steps 2 and 3 until proper tracking is obtained.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Turn treble and bass controls so that flat side of shaft is up.
Turn volume control to maximum clockwise.
Remove antenna leads from receiver.
Remove V1 and V2 from their sockets.
Use only enough generator output to provide usable indication on meter.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over 12AT7 (V3). Low side to tube shield.	10.7MC (Unmod)	FM	Point of non-interference	DC probe thru 100KΩ to point (A). Common to chassis.	A13, A14 A15, A16 A17, A18 A19, A20	Remove V9 from socket. Adjust in order given until maximum deflection is obtained. Replace V9 in its socket.
5.	"	"	"	"	"	DC probe thru 100KΩ to point (B). Common to chassis	A21	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe thru 100KΩ to point (C). Common to chassis.	A22	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

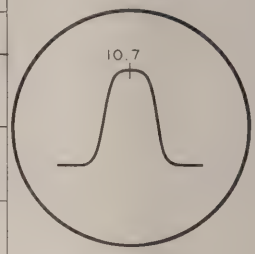

FIG. 1

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Turn treble and bass controls so that flat side of shaft is up.
Remove V1 and V2 from their sockets.
Use only enough sweep generator output to provide usable indication on scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over 12AT7 (V3). Low side to tube shield.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 100KΩ to point (A). Low side to chassis.	A13, A14 A15, A16 A17, A18 A19, A20	Remove V9 from socket. Adjust in order given for response curve similar to Fig. 1. Replace V9 in its socket.
5.	"	"	"	"	"	Vert Amp. thru 100KΩ to point (B). Low side to chassis.	A21	Adjust for response curve similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A22	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A21 for maximum amplitude and straightness of cross-over lines.

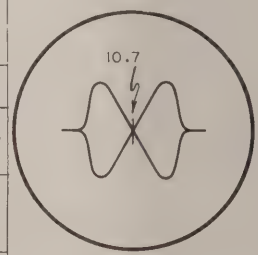

FIG. 2

FM RF ALIGNMENT

Replace V1 and V2 in their sockets.
Ground center and lower FM antenna terminal on the FM antenna terminal strip.
Restore tube shield over V3 to its normal position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Direct	High side to upper FM antenna terminal. Low side to chassis.	106MC (Unmod)	FM	106MC	DC probe thru 100KΩ to point (A). Common	A23	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	A24	"
9.	"	"	106MC	"	Tune to 106MC signal	"	A25, A26	"
10.	"	"	90MC	"	Tune to 90MC signal	"	L3	Adjust for maximum deflection by compressing or expanding coil turns.
11.	"	"	"	"	Tune to 90MC signal	"	A27	Adjust for maximum deflection. Repeat steps 7 thru 11 until proper tracking is obtained.

10KC WHISTLE FILTER ADJUSTMENT

Connect the signal generator and output meter as outlined in step 1. Set the generator for 455KC with 10KC modulation. Adjust A28 for MINIMUM output.

PHONO HUM ADJUSTMENT

The phono hum adjustment control (R4A) may be readjusted if 60∿ hum becomes noticeable. To make this adjustment proceed as follows:

1. Turn selector switch to "Ortho" position.
2. Turn bass and treble controls maximum clockwise.
3. Connect vertical amplifier of scope across voice coil.
4. Adjust R4A for minimum hum. (Turn-table must not be in operation during this adjustment).

AUDIO BALANCE ADJUSTMENT

Should V18 or V19 be replaced or if omission becomes low in either tube, distortion may occur due to "push-pull" amplifier unbalance. To correct any unbalance in the "push-pull" output tubes connect a 0-100MA meter into the meter jacks, located in cathode of V18 and V19, and note current readings for each tube. Adjust R82A until the current readings thru each tube are equal.

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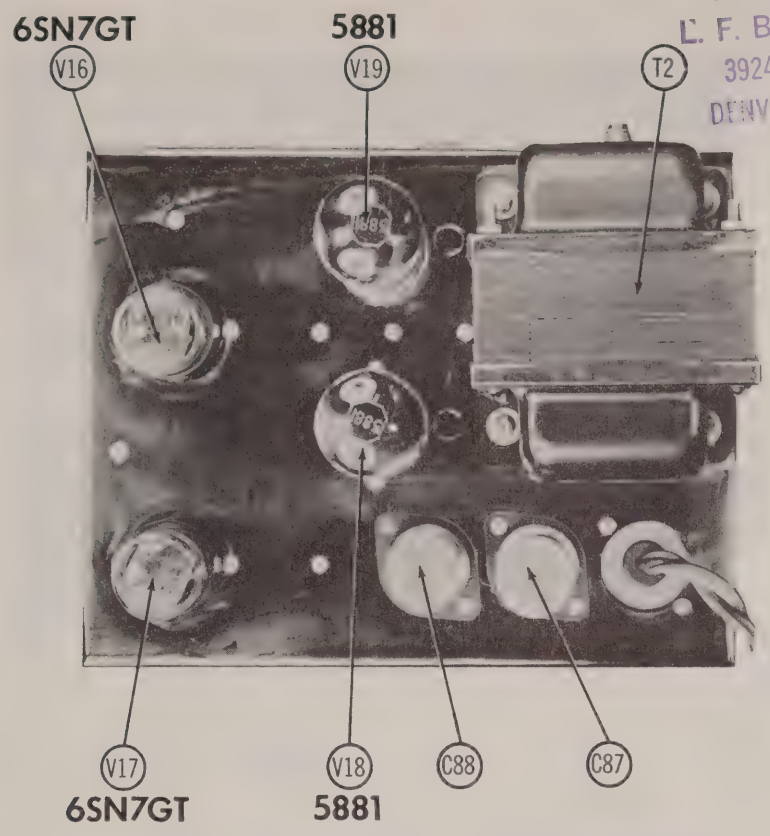
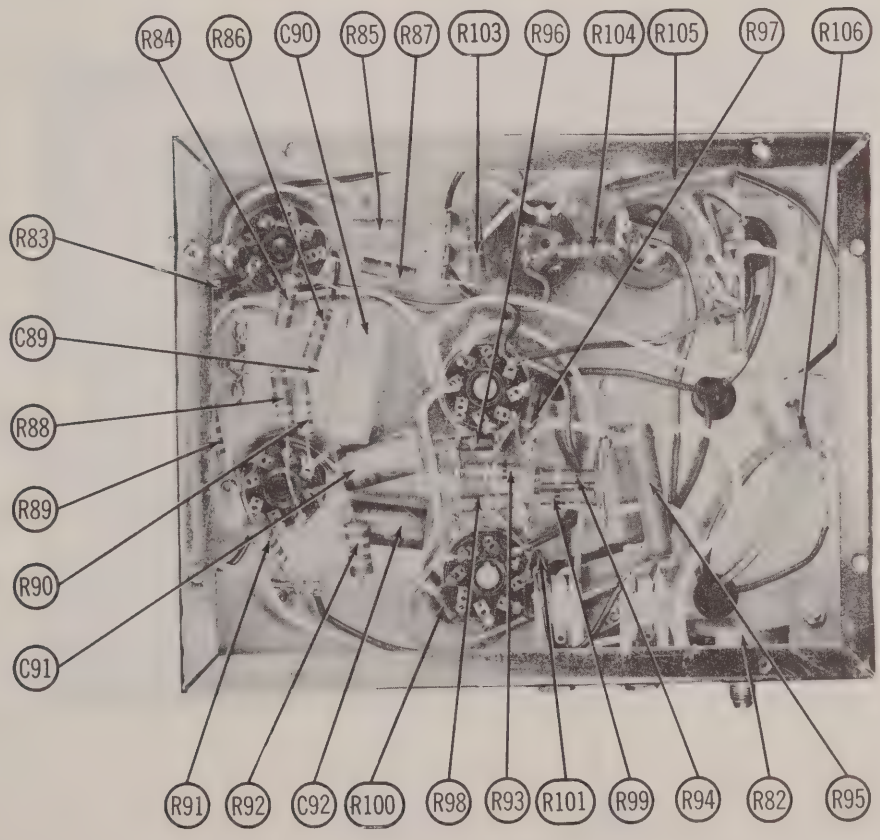
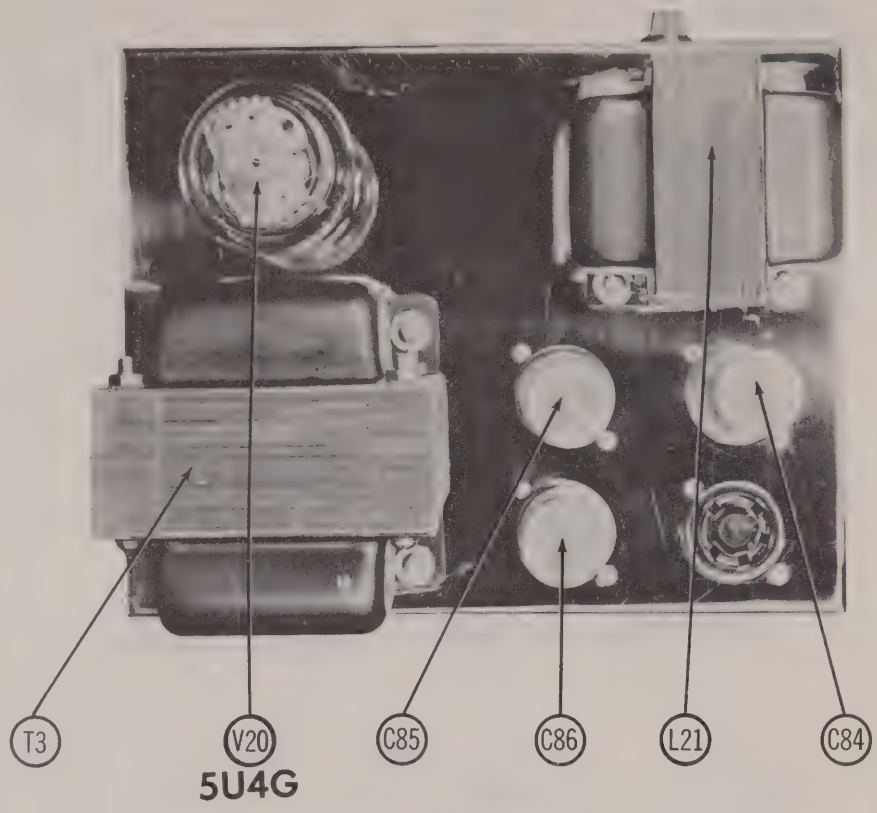
DENVER, COLORADO



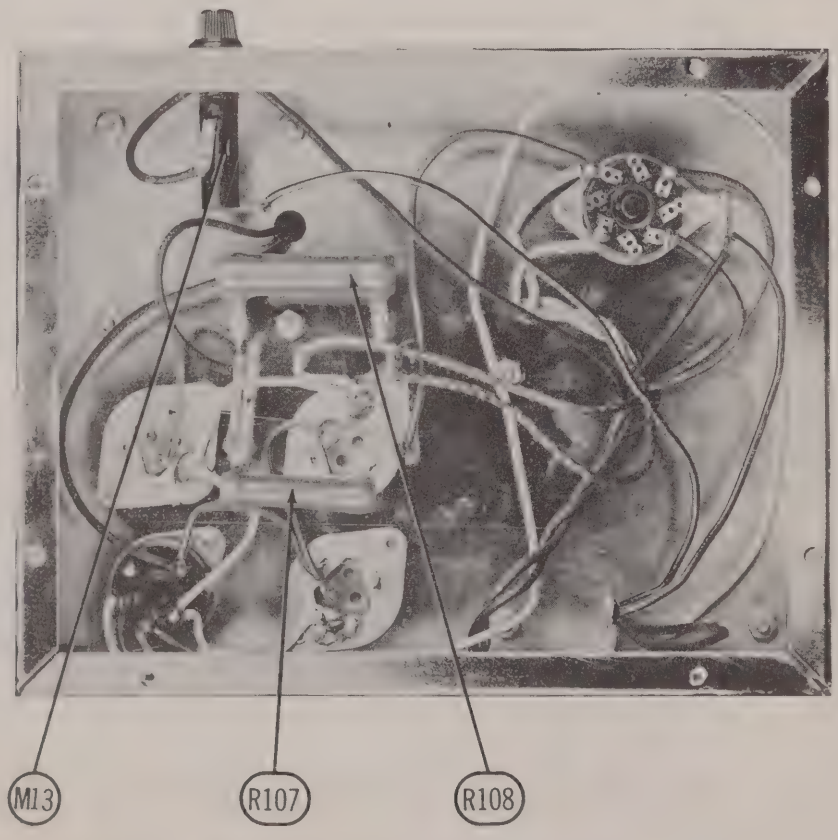
AUDIO CHASSIS TOP VIEW



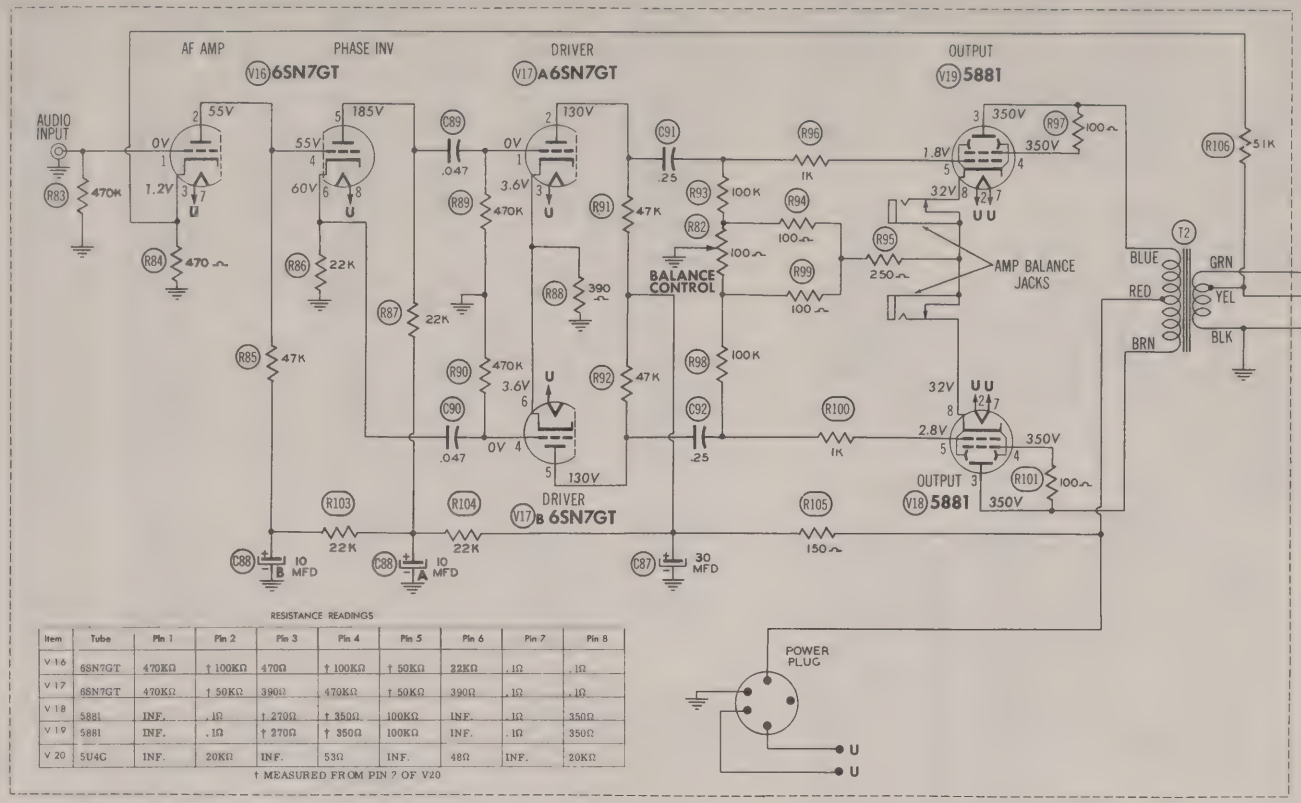
AUDIO CHASSIS BOTTOM VIEW



POWER SUPPLY CHASSIS-TOP VIEW



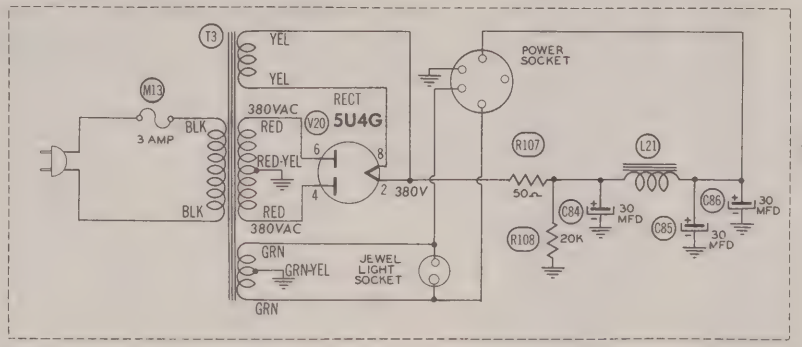
POWER SUPPLY CHASSIS-BOTTOM VIEW



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 16	6SN7GT	470KΩ	† 100KΩ	470Ω	† 100KΩ	† 50KΩ	22KΩ	.1Ω	.1Ω
V 17	6SN7GT	470KΩ	† 50KΩ	390Ω	470KΩ	† 50KΩ	390Ω	.1Ω	.1Ω
V 18	5881	INF.	.1Ω	† 270Ω	† 350Ω	100KΩ	INF.	.1Ω	350Ω
V 19	5881	INF.	.1Ω	† 270Ω	† 350Ω	100KΩ	INF.	.1Ω	350Ω
V 20	5U4G	INF.	20KΩ	INF.	53Ω	INF.	48Ω	INF.	20KΩ

† MEASURED FROM PIN 7 OF V20



1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

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DENVER, COLORADO

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AUDIO & POWER CHASSIS SCHEMATIC

ADMIRAL
MODEL HiFi 6

TUNER CHASSIS—PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	FM RF Amplifier	6CB6	6CB6	7CM	
V2	AM-FM Oscillator-FM AFC	12AT7	12AT7	9A	
V3	AM Mixer-FM Mixer	12AT7	12AT7	9A	
V4	AM RF Amplifier	6BJ6	6BJ6	7CM	
V5	1st AM FM IF Amp.	6BJ6	6BJ6	7CM	
V6	2nd AM FM IF Amp.	6AU6	6AU6	7BK	
V7	3rd FM IF Amp.	6AU6	6AU6	7BK	
V8	1st Limiter	6AU6	6AU6	7BK	
V9	2nd Limiter	6AU6	6AU6	7BK	
V10	Discriminator	6AL5	6AL5	6BT	
V11	AM Det-AF Amp.-AVC	6AV6	6AV6	7BT	
V12	Phono Pre Amp.	6AV6	6AV6	7BT	
V13	Cath. Follower	12AX7	12AX7	9A	
V14	Tuning Indicator	6AL7GT	6AL7GT	8CH	
V15	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	67C7-20	AFH4-93		D121		FP419.5	TVL-4720	
B	■40	300								
C	▲30	300								
D	20	300								
C2A	■40	300	67C7-61	AFH2-52		C022		FP230.3		
B	▲10	300								
C3	25	25	67A4-13	PRS25/25		BR252		TC26	TVA-1205	
C4	25	25	67A4-13	PRS25/25		BR252		TC26	TVA-1205	
C5	15		65C6-18	SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C6	47		65C6-79	SI47N750	TCN-47	TN14	N750A-470	NT-5447	5TCU-Q47	
C7	150		65C6-93	SI150	D6-151	TZ35	GP1K-151	UC-5315	5GA-T15	
C8	150		65C6-93	SI150	D6-151	TZ35	GP1K-151	UC-5315	5GA-T15	
C9	47		65C6-79	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C10	1.2		65B28-012							
C11	1-6		66A38-3							
C12	22		65C6-47	SI22NP0	TCZ-22	TZ14	NP0K-220	ZT-542	5TCU-Q22	
C13	15		65C6-18	SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C14	47		65C6-79	SI47N750	TCN-47	TN14	N750A-470	NT-5447	5TCU-Q47	
C15	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	22		65C6-47	SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C17	2		65C6-58	SI2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C18	100		65C6-3	SI100NP0	TCZ-101	TZ30	NP0K-101	ZT-531	5TCC-T1	
C19	220		65C6-80	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C20	1-9		66A38-3							
C21	1-9		66A38-3							
C22	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C23	220		65C6-80	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C24	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C25	.047	400	65A13-10							
C26	2		65C6-58	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C27	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C28	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C30	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C31	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C32	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C33	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C34	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C35	.047	400	65A13-10							
C36	220		65C6-80	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C37	220		65C6-80	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C38	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C39	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C40	.047	400	65A13-10							
C41	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C42	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C43	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C44	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C45	2200		65C10-15	BPD-0022	DD-222	K073	801-0022	DC-5222	5HK-D22	
C46	.047	400	65A13-10							
C47	3300		65C10-16	BPD-0033	DD-332	K077	801-0033	DC-5233	5HK-D33	
C48	47		65C6-79	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C49	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C50	15		65C6-18	SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C51	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C52	22		65C6-47	SI22	D6-220	TP22	GP1K-220	UC-5322	5GA-Q22	
C53	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C54	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C55	100		65C6-3	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C56	470	500	65B21-471	1464-0005		1R5T47		MCE245	MS-35	
C57	100		65C6-3	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C58	.047	400	65A13-10							
C59	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C60	100		65C6-3	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C61	.1	400	65A13-12							
C62	.01	400	65A13-6							
C63	.22	400	65A13-13							
C64	.1	400	65A13-12							
C65	.0056	400	65A13-9							
C66	.056	400	65A13-11							
C67	330	500	65B21-331	1464-00035		1R5T33		MCE241	1FM-335	
C68	.0033	400	65A13-7							
C69	.1	400	65A13-12							
C70	.01	400	65A13-6							
C71	.22	400	65A13-13							
C72	.0056	400	65A13-9							
C73	.1	400	65A13-12							
C74	.1	400	65A13-12							
C75	1000	500	65B21-102	1464-001		1R5D1		MCE255	MS-21	
C76	.01	400	65A13-6							
C77	.0033	400	65A13-7							
C78	.0047	400	65A13-8	P488-0047	D6-472	CUB4D47	GP2-333-472	PT4247	4TM-D47	
C79	680	500	65B20-681	1464-0007		1R5T68			MS-37	
C80	220	500	65B20-221	1464-0002		1R5T22		MCE237	1FM-325	
C81	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C82	.01	600	65A13-3							
C83	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	23S734	Q11-133	A47-500-S	B-59	U-50	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	23S738	Q13-133		BB-104	UF55A	Volume
B	500KΩ	½		M13-133			UR55A	
C	Shaft		Not Req.	C3		Not Req.	DS-36	Attach to R2A
R3A	500KΩ	½	23S732	Q13-133	A47-500K-Z	AB-60		Treble
B	Shaft		Not Req.	C-3	FS-5	AK-22		Attach to R3A
C	Switch		Not Req.	76-1	SWE-12	KB-1		
R4A	5000Ω	½	23S735	Q11-114	A47-5000-S	AB-10	U-14	Hum
B	Shaft		Not Req.	Not Req.	FKS-14	AK-1	Not Req.	Attach to R4A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R5	220Ω	½	60B8-221	BTS-220	
R6	1000Ω	½	60B8-102	BTS-1000	
R7	1500Ω	½	60B8-152	BTS-1500	
R8	33KΩ	½	60B8-333	BTS-33K	
R9	330Ω	½	60B8-331	BTS-330	
R10	220Ω	½	60B8-221	BTS-220	
R11	10KΩ	1	60B14-103	BTA-10K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R12	47KΩ	1	60B14-473	BTA-47K	
R13	100KΩ	½	60B8-104	BTS-100K	
R14	1000Ω	½	60B8-102	BTS-1000	
R15	1000Ω	½	60B8-102	BTS-1000	
R16	2200Ω	½	60B8-222	BTS-2200	
R17	10KΩ	½	60B8-103	BTS-10K	
R18	2200Ω	½	60B8-222	BTS-2200	Note 1

(CONT'D ON NEXT PAGE)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R19	33Ω	1/2	60B8-330	BTS-33	
R20	10KΩ	1/2	60B8-103	BTS-10K	
R21	220Ω	1/2	60B8-224	BTS-220K	
R22	220KΩ	1/2	60B8-224	BTS-220K	
R23	33Ω	1/2	60B8-330	BTS-33	
R24	68Ω	1/2	60B8-680	BTS-68	
R25	15KΩ	1	60B8-153	BTA-15K	
R26	3900Ω	1	60B14-392	BTA-3900	
R27	1000Ω	1/2	60B8-102	BTS-1000	
R28	68Ω	1/2	60B8-680	BTS-68	
R29	15KΩ	1	60B14-153	BTA-15K	
R30	3900Ω	1	60B14-392	BTA-3900	
R31	1500Ω	1/2	60B8-152	BTS-1500	
R32	220Ω	1/2	60B8-221	BTS-220	
R33	2700Ω	1	60B14-272	BTA-2700	
R34	47KΩ	1/2	60B8-473	BTS-37K	
R35	47KΩ	1	60B8-103	BTA-47K	
R36	10KΩ	1/2	60B14-473	BTS-10K	
R37	100KΩ	1/2	60B8-104	BTS-100K	
R38	15KΩ	1/2	60B8-153	BTS-15K	
R39	22KΩ	1	60B8-223	BTA-22K	
R40	1000Ω	1/2	60B8-102	BTS-1000	
R21	150KΩ	1/2	60B8-154	BTS-150K	
R42	47KΩ	1	60B14-473	BTA-47K	
R43	100Ω	1/2	60B8-104	BTS-100K	
R44	100KΩ	1/2	60B8-104	BTS-100K	
R45	150KΩ	1/2	60B8-154	BTS-150K	
R46	1 Meg	1/2	60B8-105	BTS-1 Meg	
R47	470K	1/2	60B8-474	BTS-470K	
R48	2. 2Meg	1/2	60B8-225	BTS-2. 2Meg	
R49	330KΩ	1/2	60B8-334	BTS-330K	
R50	560KΩ	1/2	60B8-564	BTS-560K	
R51	2200Ω	1/2	60B8-222	BTS-2200	
R52	22KΩ	1/2	60B8-223	BTS-22K	
R53	100KΩ	1	60B14-104	BTA-100K	
R54	22 Meg	1/2	60B8-226	BTS-22Meg	
R55	10KΩ	1/2	60B8-103	BTS-10K	
R56	1500KΩ	1/2	60B8-152	BTS-1500	
R57	82KΩ	1/2	60B8-823	BTS-82K	
R58	180KΩ	1/2	60B8-184	BTS-180K	
R59	470KΩ	1/2	60B8-474	BTS-470K	
R60	22KΩ	1/2	60B8-223	BTS-22K	
R61	470Ω	1/2	60B8-471	BTS-470	
R62	47KΩ 5%	1/2	60B7-473	BTS-47K	
R63	47KΩ 5%	1/2	60B7-473	BTS-47K	
R64	4700Ω 5%	1/2	60B7-473	BTS-4700	
R65	1500Ω	1/2	60B8-152	BTS-1500	
R66	6800Ω	1/2	60B8-682	BTS-6800	
R67	220KΩ	1	60B14-224	BTA-220K	
R68	470KΩ	1/2	60B8-471	BTS-470K	
R69	470Ω	1/2	60B8-471	BTS-470	
R70	22KΩ	1/2	60B8-223	BTS-22K	
R71	1 Meg	1/2	60B8-105	BTS-1 Meg	
R72	1 Meg	1/2	60B8-105	BTS-1 Meg	
R73	3300Ω 5%	2	60B7-332	BTS-3300	
R74	1 Meg	1/2	60B8-105	BTS-1 Meg	
R75	6. 8Meg	1/2	60B7-685	BTS-6. 8Meg	
R76	. 47Ω	5	61A16-3		
R77	33KΩ	1/2	60B8-333	BTS-33K	
R78	150KΩ	1/2	60B8-154	BTS-150K	
R79	220Ω	2	60B20-221	BTB-220	
R80	750Ω	10	61A7-30	1 3/4A-750	
R81	2200Ω	1	60B14-222	BTA-2200	

Note 1. Some models may use 22K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .58A	400VCT .067A	5VAC @ 2A	6. 3VAC @ . 85A SEC. 4 6. 3VAC @ 3. 5A	80A42					

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0ΩCT	0Ω	69A184-1				
L2	FM RF Choke	3Ω		73A17-1	19-1003		4608	3. 3Microhenries; IRC Part No. CLA
L3	FM RF Coil	0Ω		69A184-6				
L4	FM Osc. Coil	0Ω	0Ω	69A184-4				
L5	AM Ant. Coil	30Ω *	5. 3Ω	69A184-2				
L6	AM RF Coil	105Ω	5Ω	69A184-2				
L7	AM Osc. Coil	. 9Ω	4. 2Ω	69A184-5	14-1060	BC-392	71-Osc.	
L8	1st FM IF	. 9Ω	. 9Ω	72A120-1	16-3487	FM-254	1463	
L9	1st AM IF	7. 5Ω	7. 5Ω	72A120-3	16-6758	BC-352	12-C1	
L10	Fil. Choke	0Ω		73A17-2	19-1001		4604	
L11	2nd FM IF	1. 1Ω	1. 1Ω	72A120-1	16-3487	FM-254	1463	
L12	2nd AM IF	4. 8Ω	4. 8Ω	72A120-4	16-6758	BC-353	12-C2	
L13	Fil. Choke	0Ω		73A17-2	19-1001		4604	
L14	3rd FM IF	1. 1Ω	1. 1Ω	72A120-1	16-3487	FM-254	1463	
L15	3rd AM IF	4. 8Ω	4. 8Ω	72A120-4	16-6758	BC-353	12-C2	
L16	Fil. Choke	0Ω		73A17-2	19-1001		4604	
L17	FM Limiter	1. 1Ω	1. 1Ω	72A120-1	16-3487	FM-254	1463	
L18	Fil. Choke	0Ω		73A17-2	19-1001		4604	
L19	Fil. Choke	0Ω		73A17-2	19-1001		4604	
L20	FM Discrim.	1. 2Ω	. 8ΩCT	72A120-2	17-3484 ■	FM-253	1464	

* Tapped @ 1Ω.
■ Drill mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V	84A1-13		312002 (2A-3AG)	341001	AGC2	HKP

PHONO CARTRIDGE

ITEM No.	ADMIRAL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2	409A15-1							78RPM Cartridge
M3	409A15-2							33 1/3-45RPM Cartridge

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	ADMIRAL PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M4	98B15-26 78RPM Needle	* E-95 or † E-90	* C-340 or † C-345 or ♦ C-345D	* W-20A or † W-21S	* Metal † Jewel ♦ Diamond
M5	98B15-27 33-45 RPM Needle	* E-95LP or † E-90LP	* A-337 or † A-339 or ♦ A-339D	* W-20MGA or † W-21MGS	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M6	Dial light	81A1-5	Bayonet, # 44 Ch. 15HF1
M7	Dial light	81A1-5	Bayonet, # 44 Ch. 15HF1
M8	Tuning Cap.	68A61	18-335MMF; 18-335MMF; 19-190MMF
M9	Switch	76A29	Selector
M10	Switch	G400A606	on-off - Phono Motor
M11	Phono Motor	G400A637	Includes M11 &. 047MMF capacitor
M12	10KC Filter	98A75	
A28	Trimmer cap.	66A39	10KC Filter (200-400MMF)
	Cabinet	35E265	Model HiFi6
	Cabinet	35E266	Model Hi Fi 7
	Cabinet	35E267	Model Hi Fi8
	Knob	33B118-1	Tuning-Includes Indicator
	Knob	33B118-2	5 used

PROPERTY OF
L. F. BLANKENSHIP
3921 MILNE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

AUDIO CHASSIS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V16	AF Amp-Phase Inverter	6SN7GT	6SN7GT	8BD	
V17	Driver	6SN7GT	6SN7GT	8BD	
V18	Audio Output	5881	5881	7S	
V19	Audio Output	5881	5881	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C87	30	475	67C7-19	AFH1-56		A054		FP175	TVL-1810	
C88A	10	450	65C6-34	AFH2-47		B037		FP231	TVL-2750	
B	10	450								
C89	.047	600	64B9-9	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C90	.047	600	64B9-9	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C91	.25	600	65A30-1	P688-25		CUB6P25		PT6025	6TM-P25	
C92	.25	600	65A30-1	P688-25		CUB6P25		PT6025	6TM-P25	
C93	4	150	65B34-1							

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R82A	100Ω	2	75B13-30	W100	A43-100	VK-121	R100L	Amplifier balance-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R82A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R83	470KΩ	½	60B8-474	BTS-470K	
R84	470Ω	1	60B14-471	BTA-470	
R85	47KΩ	1	60B14-473	BTA-47K	
R86	22KΩ	1	60B14-223	BTA-22K	
R87	22KΩ	1	60B14-223	BTA-22K	
R88	390Ω	1	60B14-391	BTA-390	
R89	470KΩ	1	60B14-474	BTA-470K	
R90	470KΩ	1	60B14-474	BTA-470K	
R91	47KΩ	2	60B20-473	BTA-47K	
R92	47KΩ	2	60B20-473	BTB-47K	
R93	100KΩ	1	60B14-104	BTA-100K	
R94	100Ω	1	60B14-101	BTA-100	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R95	250Ω	10	61A7-22	1 3/4A-250	
R96	1000Ω	1	60B14-102	BTA-1000	
R97	100Ω	1	60B14-101	BTA-100	
R98	100KΩ	1	60B14-104	BTA-100K	
R99	100Ω	1	60B14-101	BTA-100	
R100	1000Ω	1	60B14-102	BTA-1000	
R101	100Ω	1	60B14-101	BTA-100	
R102	33	1	60B14-330		
R103	22K	1	60B14-223	BTA-22K	
R104	22K	1	60B14-223	BTA-22K	
R105	150	10	61A7-19	B3/4A-150	
R106	5100Ω 5%	1	60B-13512	BTA-5100	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	15"	PM	12. 8Ω	78B86-2		15A10	① Tweeter
SP2		PM	13. 8Ω	78B87-2 ①			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	6. 8KΩ	16. 4Ω tap ② 8Ω	79B50	A-8056 ①	A-3031 ①	S-38A ①	H4103 ①		① Drill new mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

POWER CHASSIS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V20	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C84	30	475	65C7-19	AFH1-56		A054		FP175	TVL-1810	
C85	30	475	65C7-19	AFH1-56		A054		FP175	TVL-1810	
C86	30	475	65C7-19	AFH1-56		A054		FP175	TVL-1810	

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R107	50Ω	10	61A7-15	1 3/4A-50	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R108	20KΩ	20	61A16-2	2D-20K	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T3	117VAC	780VCT	5VAC	6. 3VAC	80B40	PC-8412 ① ②	P-3155 ① ②	R-21A ① ②	P9402 ① ②	24R07U ① ②
	③ L. 24A	.150ADC	③ 3A	③ 3. 3A						

① Drill new mounting holes.
② Tape 6. 3V center tap.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L21	.150ADC	79. 2Ω	5. 8HY	74B21	C-1410 ①	C-3196	C-14A ①	C5031 ①	20C55 ①

① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M13	3A	3A 250V	84A1-14		312003 (3A-3AG)	342001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M14	Jewel lite	81A1-8	Type # 44

ARVIN
MODELS 852P, 854P (Ch. RE372)

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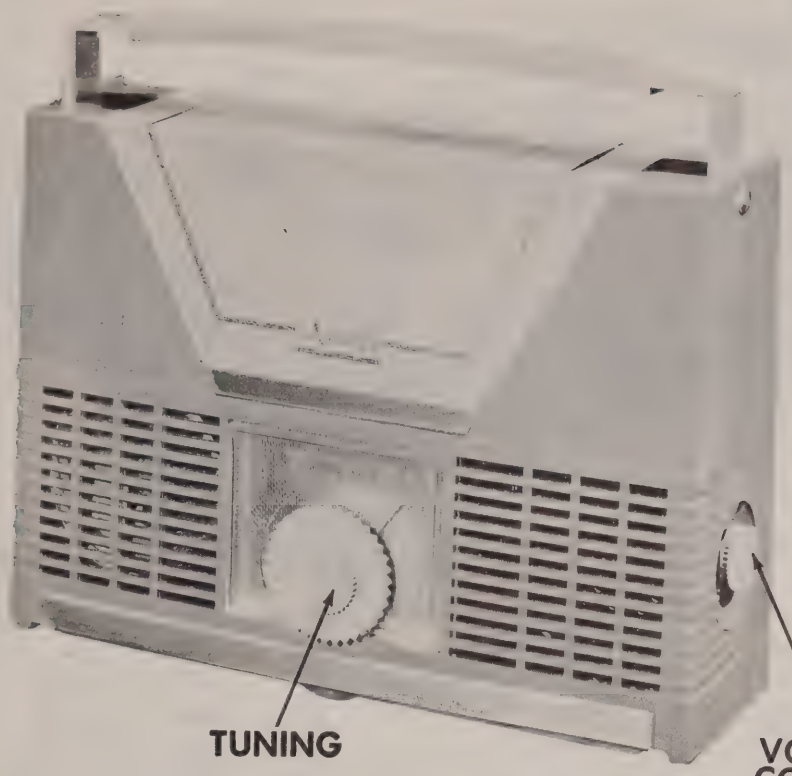
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

ARVIN
MODELS 852P, 854P (Ch. RE372)



ARVIN
MODELS 852P, 854P (Ch. RE372)

TRADE NAME	Arvin Models 852P, 854P (Ch. RE372)
MANUFACTURER	Arvin Industries, Columbus, Ohio
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1T4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 90 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 55MA @ 7.5Volts DC & 15MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

ARVIN
MODEL 852P, (Ch. RE372)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1T4	1T4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	42079	PRS106D50A		BBRT4415-X25			TVA-3433	Red
B	40	150								Blue
C	250	10								Orange
C2	10000		22295	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	47		20300-470							
C4	.047	200	20067-473	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C5	5000		21674	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6	20000		40053-203	BPD-02	DD-203	K084		DC-512	5HK-S2	
C7A	150		♦41632	♦PA-136	♦PC-160	TP36	GP1K-151	UC-5315	♦DP-1	
B	2000					K072	801-002	DC-522		
C	100					TP34	GP1K-101	UC-531		
D	10000					K082	811-01	DC-511		
E	5000					K080	801-005	DC-525		
C8	10000		22295	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	3300		40054-332	SI3300	D6-332	K077	GP2-333-332	UC-5233	5GA-D33	
C10	20000		40053-203	BPD-02	DD-203	K084		DC-512	5HK-S2	
C11	.1	400	20068-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

♦ Items C7A, C7B, C7C, C7D, C7E, R7A, R7B, R7C and R7D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	D42098	Q13-137	A47-1Meg-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

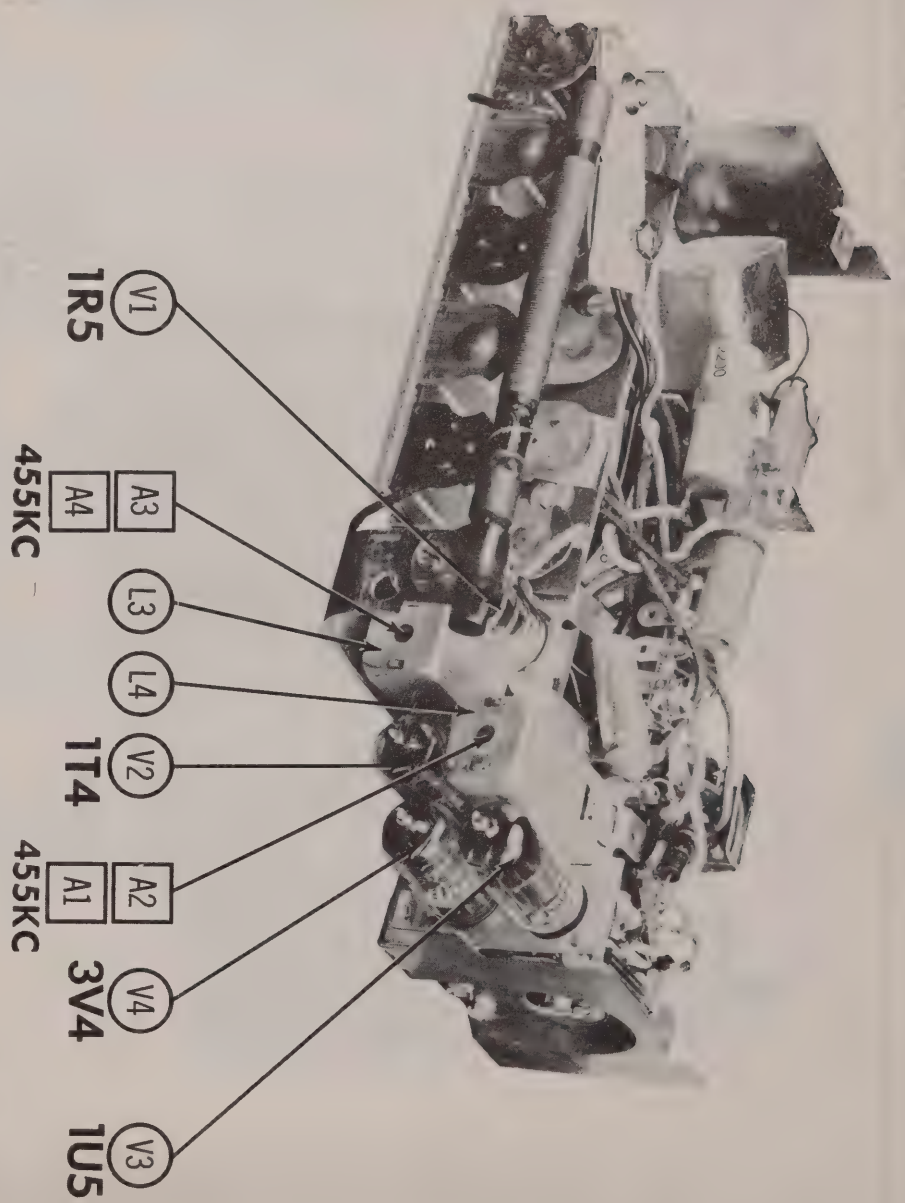
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	100KΩ	½	20061-104	BTS-100K	
R3	2.2Meg	½	20061-225	BTS-2.2Meg	
R4	1 Meg	½	20061-105	BTS-1 Meg	
R5	2.2Meg	½	20061-225	BTS-2.2Meg	
R6	18KΩ	½	22381-183	BTS-18K	
R7A	10 Meg	½	♦41632	BTS-10 Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1 Meg	½		BTS-1 Meg	
D	1 Meg	½		BTS-1 Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R8	2700Ω	1	20070-272	BTA-2700	
R9	2200Ω	10	42076		
R10	47Ω	1	19177		
R11	1000Ω	½	20061-102	BTS-1000	
R12	1000Ω	½	20061-102	BTS-1000	
R13	820Ω	½	20061-821	BTS-820	
R14	680Ω	½	20061-681	BTS-680	

♦ Items R7A, R7B, R7V, R7D, C7A, C7B, C7C, C7D, C7E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.8KΩ	3.5Ω	42026-1	A-3329 ①					① Bend mounting tabs down. File out slots. Mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: ARVIN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	3"	PM	3.5Ω	41728			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.5Ω		42075-1				
L2	Osc. Coil	1.8Ω	8.2Ω	42071-1	14-1074		71-Osc.	
L3	Input IF	14Ω	14Ω	21797-6	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	21797-16	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA: ARVIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.067A	20207-5	1003	RS75	6S75	75	5M4	

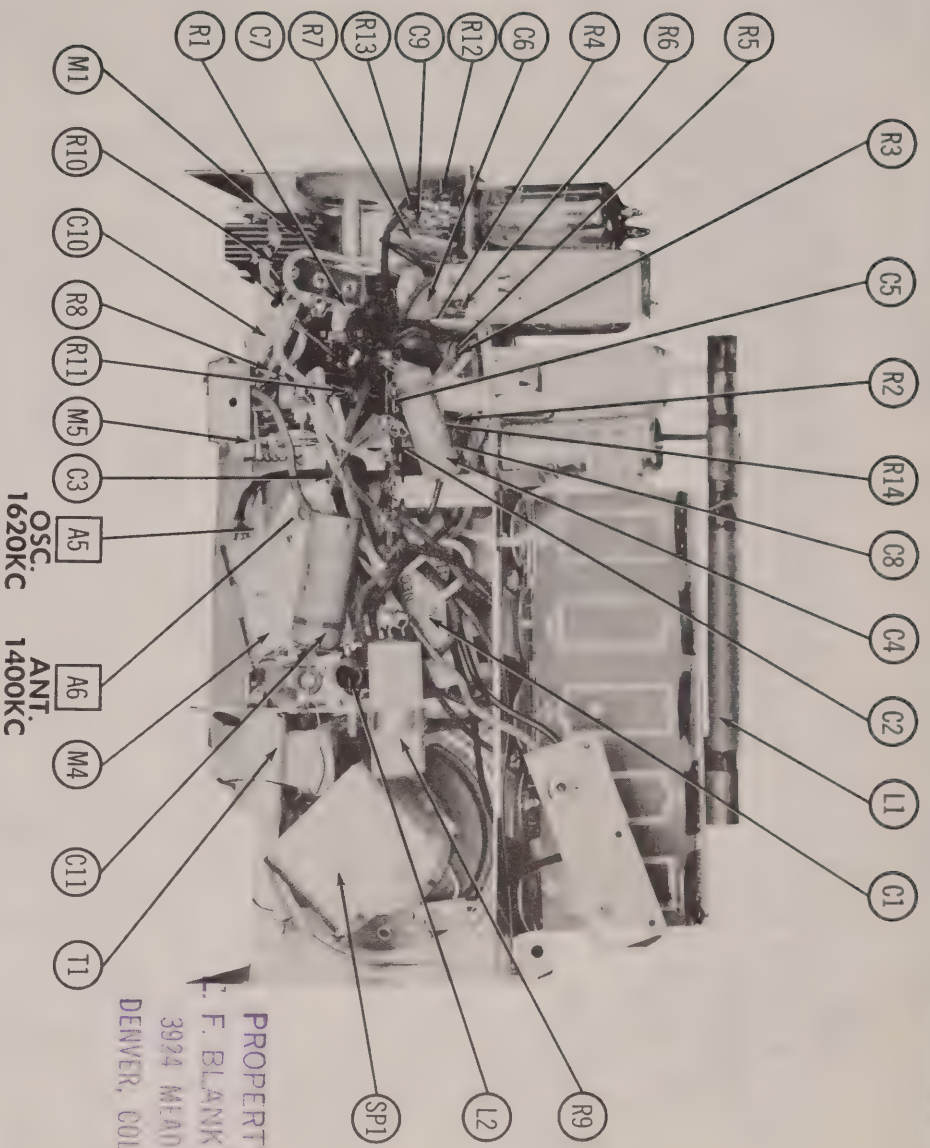
BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1.5V		635			#1			5 connected in series
M3	45V			455			XX30		2 connected in series

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M4	Tuning Cap.	41763	11-222, 16-115MMF
M5	Switch	41806	Change-over
	Cabinet Assy.	42053-1	Green - Model 854P
	Cabinet Assy.	42198-1	Alligator - Model 852P
	Cabinet Assy.	42053-2	Red - Model 854P
	Cabinet Assy.	42198-2	Tan - Model 852P
	Cabinet Assy.	42053-3	Tan - Model 854P
	Cabinet Assy.	42198-3	Plaid - Model 852P
	Knob	41958-1	On/off/volume - Model 854P
	Knob	22924-6	On/off/volume - Model 852P
	Knob	41959-1	Tuning - Models 854P & 852P
	Dial Pointer	42072	Model 854P
	Dial Pointer	42189	Model 852P
	Radio Dial	41979	Model 854P

CHASSIS—BOTTOM VIEW



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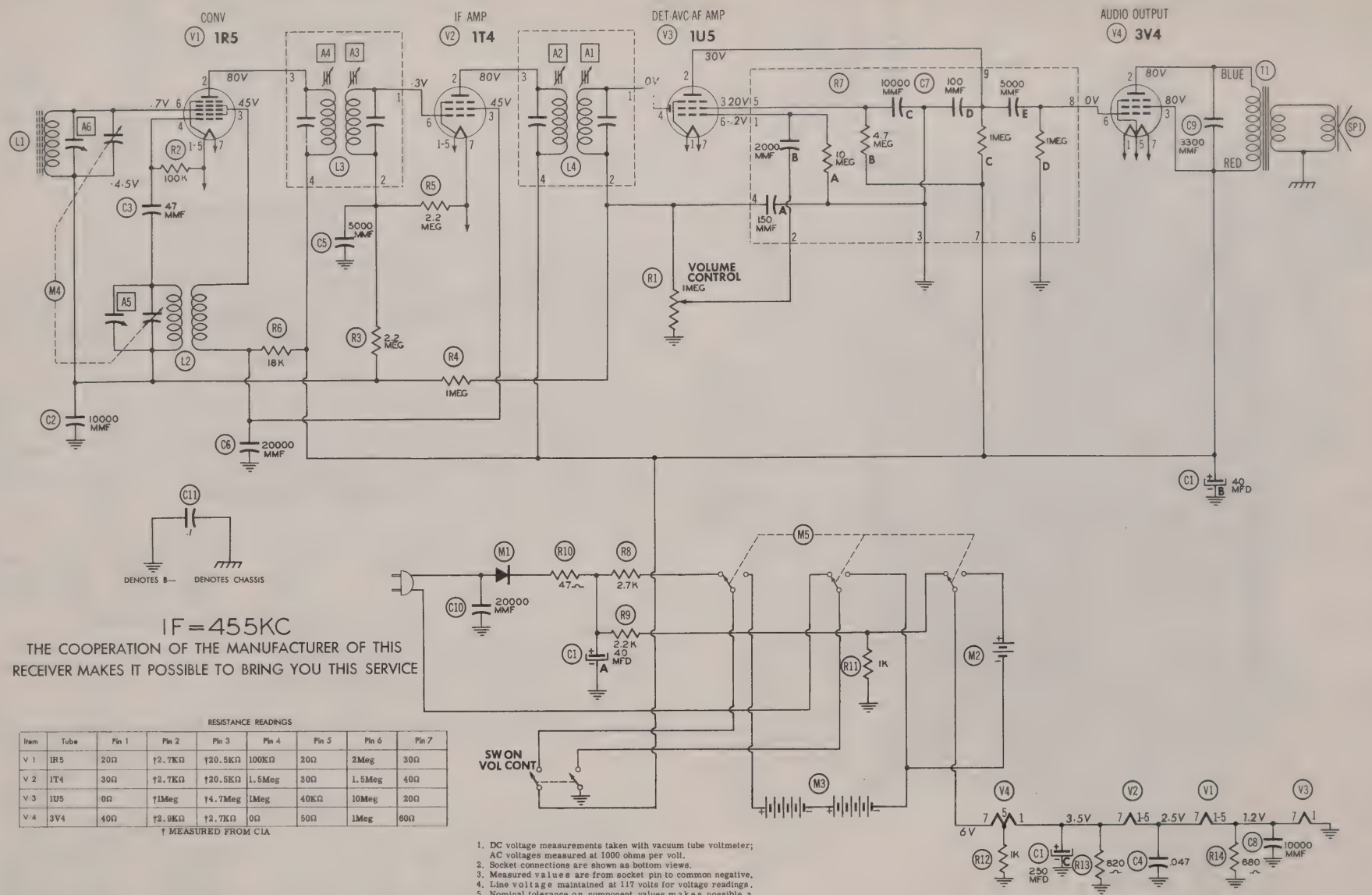
ARVIN
MODEL 852P, (Ch. RE372)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	20Ω	†2.7KΩ	†20.5KΩ	100KΩ	20Ω	2Meg	30Ω
V 2	1T4	30Ω	†2.7KΩ	†20.5KΩ	1.5Meg	30Ω	1.5Meg	40Ω
V 3	1U5	0Ω	†1Meg	†4.7Meg	1Meg	40KΩ	10Meg	20Ω
V 4	3V4	40Ω	†2.9KΩ	†2.7KΩ	0Ω	50Ω	1Meg	60Ω

† MEASURED FROM C1A

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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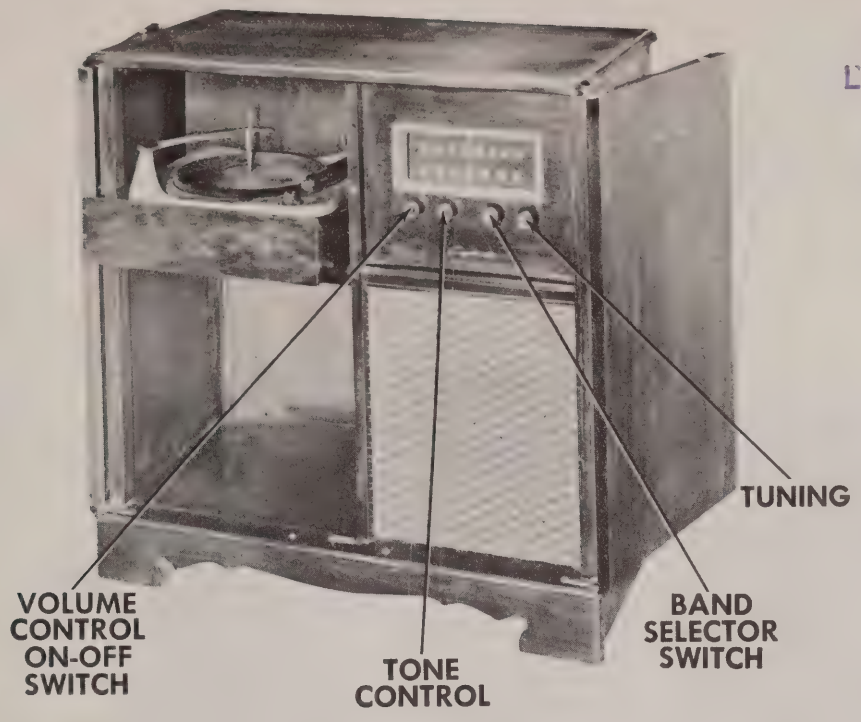
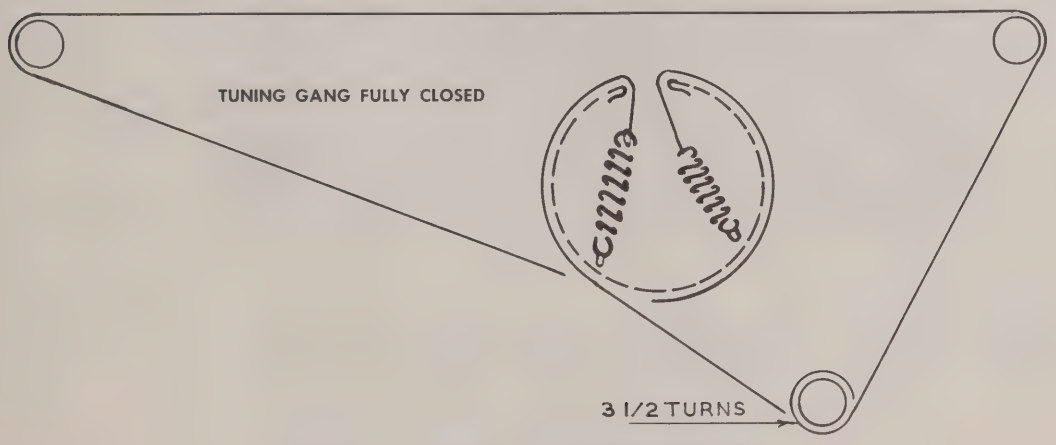
DENVER, COLORADO

CAPEHART MODELS
RP153 (Ch. CR79), RP254 (Ch. CR147)



TRADE NAME	Capehart Models RP153 (Ch. CR79), RP254 (Ch. CR147)
MANUFACTURER	Capehart-Farnsworth Corp., Ft. Wayne, Indiana
TYPE SET	AC Operated AM-FM-Phono Combination Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES (Eight)	Types 6BA6 RF Amp., 6X8 Mixer-Osc., 6BA6 AM-FM IF Amp., 6BA6 2nd. FM IF Amp., 6AL5 Ratio Det., 6AV6 AM Det.-FM AVC Clamper-AM AVC-AF Amp., 6V6GT Output, 6X5GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles — RATING .46 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	537-1620KC — FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON CAPEHART RECORD CHANGER MODEL 355-SEE SIMILAR V-M MODEL 951-PHOTOFACT SET #216 - FOLDER #11 OR RECORD CHANGER MANUAL CM-5.



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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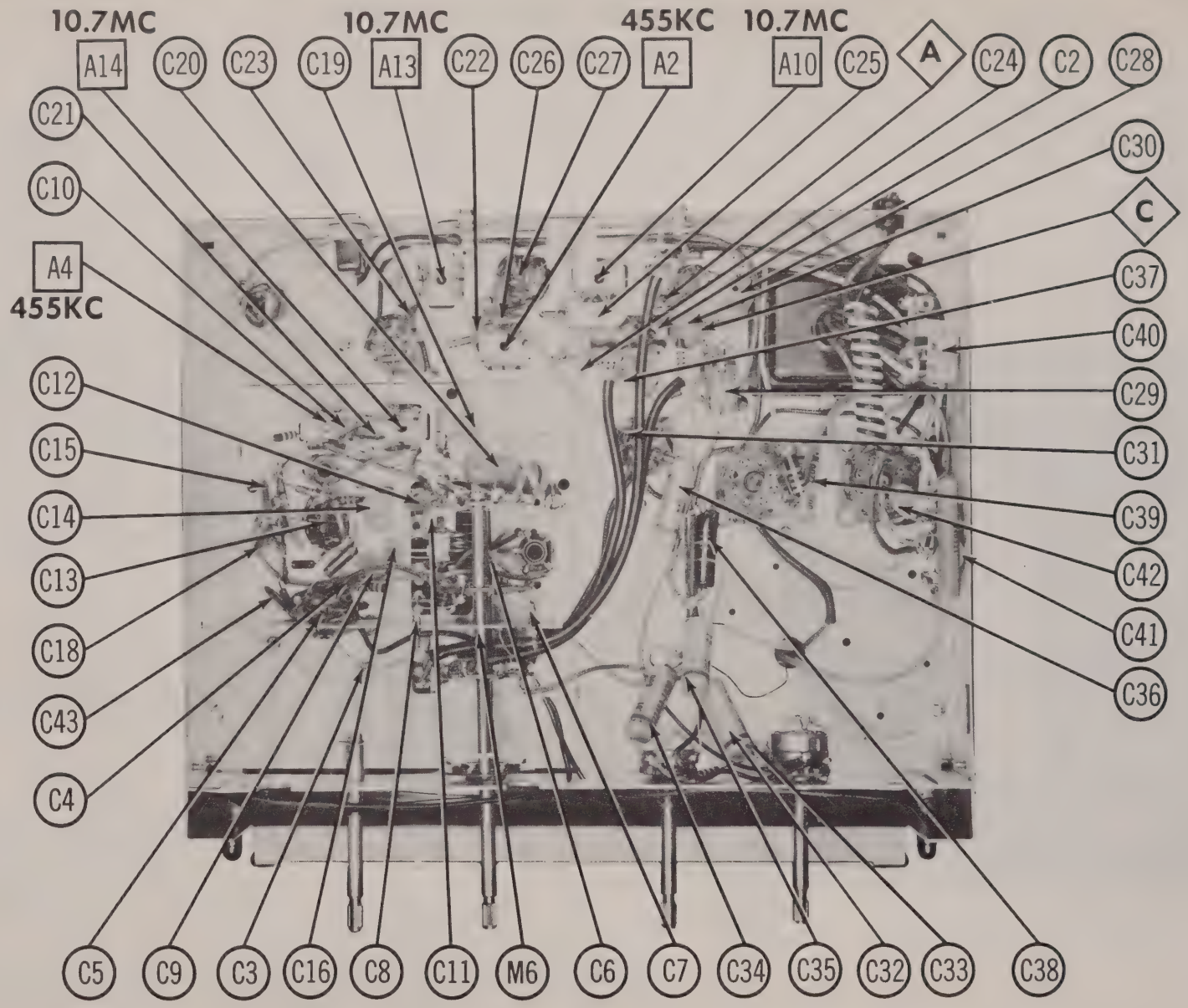
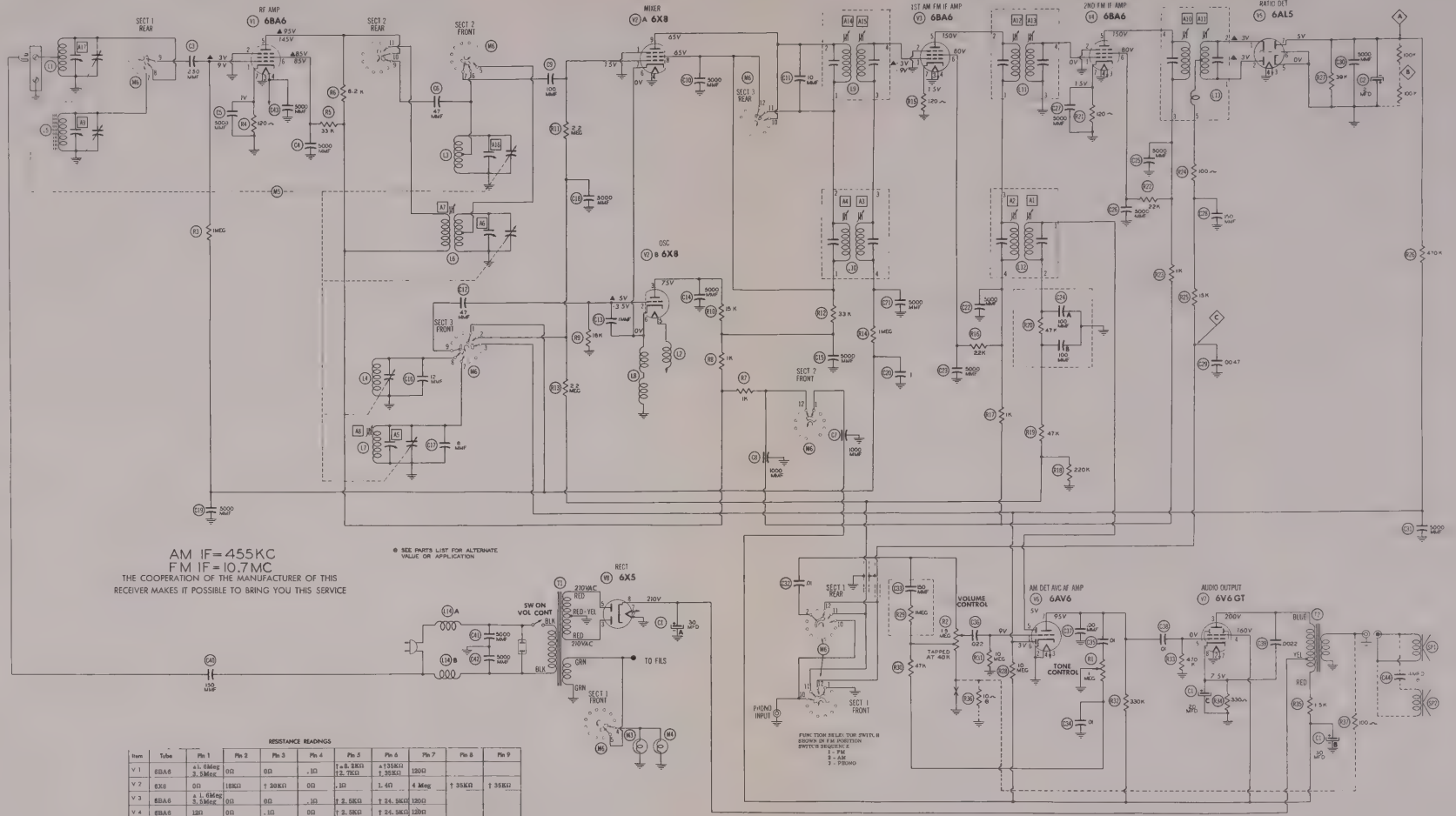


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


SECT 1 REAR
RF AMP V1 6BA6
SECT 2 REAR
SECT 2 FRONT
MIXER V7 A 6X8
SECT 3 REAR
1ST AM FM IF AMP V3 6BA6
2ND FM IF AMP V4 6BA6
RATIO DET V5 6AL5
OSC V7 B 6X8
SECT 7 FRONT
SECT 1 FRONT
AM IF = 455KC
FM IF = 10.7MC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
RECT V8 6X5
SW ON VOL CONT
TO FILS
PHONO INPUT
VOLUME CONTROL
TAPPED AT 40R
AM DET AVC AF AMP V5 6AV6
TONE CONTROL
AUDIO OUTPUT V7 6V6 GT
FUNCTION SELECTOR SWITCH SHOWN IN FM POSITION
SWITCH SEGMENT #
1 - FM
2 - AM
3 - PHONO

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	▲1.6Meg 3.5Meg	0Ω	0Ω	.1Ω	†▲8.2KΩ †2.7KΩ	▲†35KΩ †.35KΩ	120Ω		
V 2	6X8	0Ω	18KΩ	† 30KΩ	0Ω	.1Ω	1.4Ω	4 Meg	† 35KΩ	† 35KΩ
V 3	6BA6	▲1.6Meg 3.5Meg	0Ω	0Ω	.1Ω	† 2.5KΩ	† 24.5KΩ	120Ω		
V 4	6BA6	12Ω	0Ω	.1Ω	0Ω	† 2.5KΩ	† 24.5KΩ	120Ω		
V 5	6AL5	▲ INF.	▲ INF.	.1Ω	0Ω	0Ω	0Ω	38KΩ		
V 6	6AV6	10 Meg	0Ω	.1Ω	0Ω	300KΩ	470KΩ	† 300KΩ		
V 7	6V6GT	0Ω	0Ω	† 565Ω	† 1.5KΩ	470KΩ	INF.	.1Ω	300Ω	
V 8	6X5	0Ω	0Ω	129Ω	INF.	110Ω	INF.	.1Ω	160KΩ	

† MEASURED FROM PIN # 8 of V8.
ALL READINGS TAKEN IN "AM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ TAKEN IN "FM" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Normal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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258—4

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CAPEHART
MODEL RP153 (Ch. CR79)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed set dial pointer to coincide with last reference mark on low frequency end of dial scale.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6X8 (V2). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to antenna stator plates on tuning gang. Low side to chassis.	1620KC	"	"	"	A5	"
3.	"	"	1500KC	"	Tune to 1500KC signal	"	A6	"
4.	"	"	600KC	"	Tune to 600KC signal	"	A7	"
5.	"	"	537KC	"	Tuning gang fully closed	"	A8	"
6.	"	"	1500KC	"	Tune to 1500KC signal	"	A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓑ as shown on the schematic.
Use only enough signal generator output to provide usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A10	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓑ.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
9.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A12, A13	Adjust for maximum deflection.
10.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	"	"	"	"	A14,A15	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation add 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point Ⓐ. Low side to chassis.	A10	Disconnect stabilizing capacitor C2. Adjust for maximum amplitude and symmetry as in Fig. 1.
8.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A11	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.
9.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry as in Fig. 1
10.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	"	"	"	"	A14,A15	"

FM RF AND MIXER ALIGNMENT

Signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	High side thru 270Ω to ungrounded FM antenna terminals. Low side to chassis.	108.5MC (Unmod)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	C16	Adjust for maximum deflection by moving C16 nearer or farther from chassis.
12.	"	"	105MC	"	Tune to 105MC signal	"	A16,A17	Adjust for maximum deflection.
13.	"	"	87.5MC	"	Tuning gang fully closed	"	L4	Adjust for maximum deflection by compressing or expanding coil turns.
14.	"	"	90MC	"	Tune to 90MC signal	"	L1, L3	"

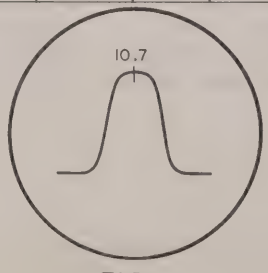


FIG. 1

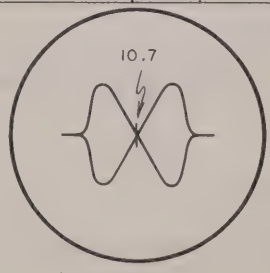


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CAPEHART PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Mixer-Oscillator	6X8	6X8	9AK	
V3	1st AM FM IF Amp.	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	AM Det-FM AVE Clamper-AM AVC-AF Amplifier	6AV6	6AV6	7BT	
V7	Audio Output	6V6GT	6V6GT	7S	
V8	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

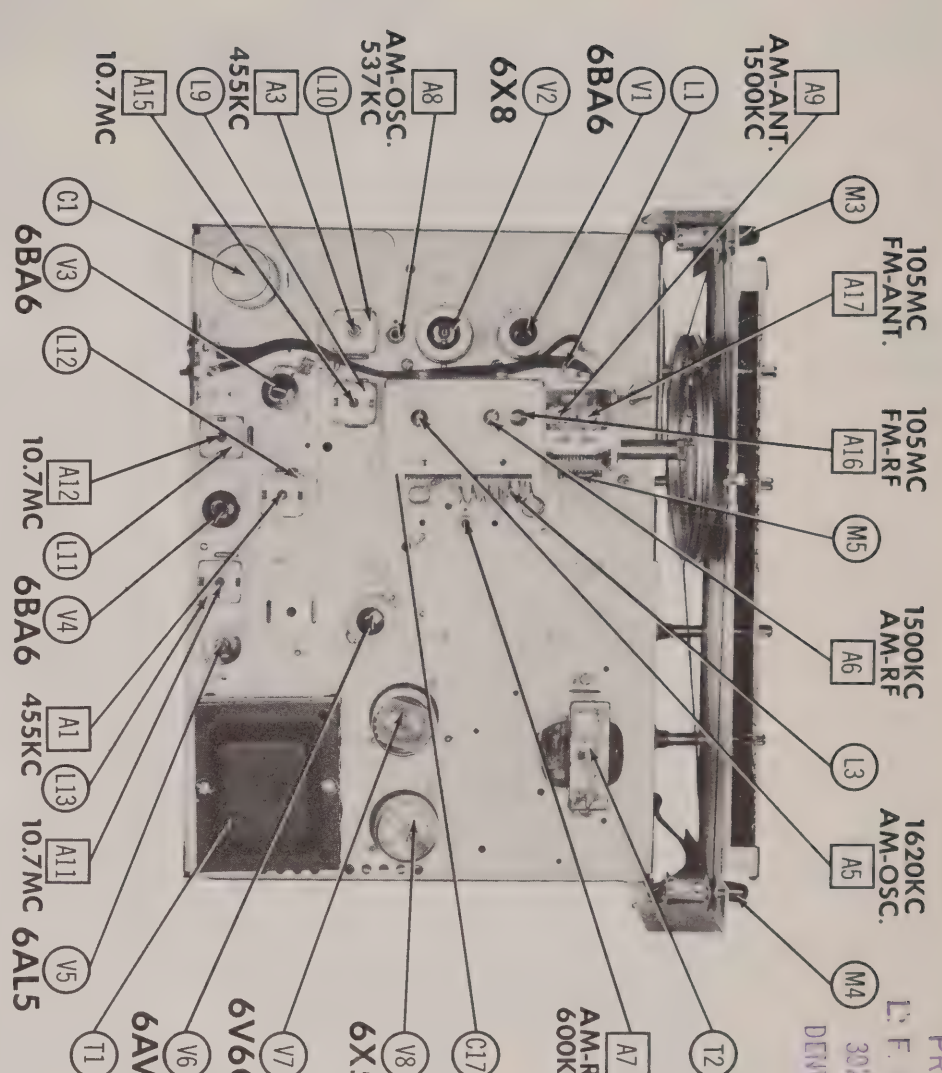
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	350	750090B-18	AFH3-109		C131		FP331	TVL-3620	
B	▲30	300								
C	20	25								
C2	2	50	452132A-1	PRS150/4		BBR2-50T		TC302	TVA-1301	
C3	250		450469A-9	SI250	D6-251	G053	GP2K-251	UC-5325	5GA-T25	
C4	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6	47		2271-0678	SI47N750	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C7	1000		650716A-1							
C8	1000		650716A-1							
C9	100		2271-0686	SI100N750	TCN-100	N042	N750K-101	NT-531	5TCU-T1	
C10	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C11	10		2271-9467							
C12	47		2271-0678	SI47N750	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C13	1.0		650501A27	SIINP0	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C14	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C15	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C16	12		2271-5599							
C17	6		650501A32							
C18	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C19	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C20	.1	200	2246-1040	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C21	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C22	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C23	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C24A	100		♦452171A-1	♦PA-97-1	♦PC-50	♦1117M1	♦1403-01	UC-531	♦D-1	
B	100							UC-531		
C25	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C26	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C27	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C28	150	500	650162A-8	1479-00015		5W5T15		MCE236	1FM-315	
C29	.0047	600	2248-4720	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C30	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C31	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C32	.01	600	2248-1030	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C33	150		*650677B-1	*PA-284	D6-151	TZ34	GP1K-151	UC-5315	5GA-T15	
C34	.01	600	2248-4720	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C35	.01	600	2284-4720	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C36	.022	200	2246-2230	P288-022		PJ2S22		PT4122	2TM-S22	
C37	100	500	750272A11	1469-0001		5W5T1		MCE235	1FM-31	
C38	.01	600	2248-4720	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C39	.0022	600	2248-2220	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C40	150	500	650162A-8	1479-00015		5W5T15		MCE236	1FM-315	
C41	5000		453521A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C42	5000		453521A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C43	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C44	4	50	650663A-3							Note 1

Note 1. Used only in Ch. CR147.

♦ Items C24A, C24B and R20 are combined in one unit.

* Items C33 and R29 are combined in one unit.

CHASSIS—TOP VIEW



PROPERTY OF
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CAPEHART PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	750266A-6	Q11-137	A47-1Meg-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2	1.5Meg	½	65-0299A-2	K				Volume & switch tapped at 40KΩ

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAPEHART PART No.	IRC PART No.	
R3	1 Meg	½	3230-105	BTS-1 Meg	
R4	120Ω	½	3229-121	BTS-120	
R5	33KΩ	½	3230-333	BTS-33K	
R6	8200Ω	½	3229-822	BTS-8200	
R7	1000Ω	½	3230-102	BTS-1000	
R8	1000Ω	½	3230-102	BTS-1000	
R9	18KΩ	½	3229-183	BTS-18K	
R10	15KΩ	½	3229-153	BTS-15K	
R11	2.2Meg	½	3230-225	BTS-2.2Meg	
R12	33KΩ	½	3230-333	BTS-33K	
R13	2.2Meg	½	3230-225	BTS-2.2Meg	
R14	1 Meg	½	3230-105	BTS-1 Meg	
R15	120Ω	½	3229-121	BTS-120	
R16	22KΩ	½	3230-223	BTS-22K	
R17	1000Ω	½	3230-102	BTS-1000	
R18	220KΩ	½	3230-224	BTS-220K	
R19	47KΩ	½	3230-473	BTS-47K	
R20	47KΩ	½	♦ 45217A-1	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAPEHART PART No.	IRC PART No.	
R21	120Ω	½	3229-121	BTS-120	
R22	22KΩ	½	3230-223	BTS-22K	
R23	1000Ω	½	3230-102	BTS-1000	
R24	100Ω	½	3229-101	BTS-100	
R25	15KΩ 5%	½	3229-153	BTS-15K 5%	
R26	470KΩ	½	3230-474	BTS-470K	
R27	39KΩ	½	3229-393	BTS-39K	
R28	10 Meg	½	3229-106	BTS-10 Meg	
R29	1 Meg	½	* 650677B-1	BTS-1 Meg	
R30	47KΩ	½	3230-473	BTS-47K	
R31	10 Meg	½	3229-106	BTS-10 Meg	
R32	330KΩ	½	3230-334	BTS-330K	
R33	470KΩ	½	3230-474	BTS-470K	
R34	330Ω	1	3232-331	BTA-330	
R35	1500Ω	7	65010A-12	PW7-1500	
R36	10Ω	½		BTS-10	Note 1
R37	100Ω	½		BTS-100	Note 1

Note 1. Used in chassis CR-79 only.
♦ Items R20, C24A, C24B are combined in one unit.
* Items R29 and C33 are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CAPEHART PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	454VCT	6.3VAC		750178A-1	PM-8419②	P-3048	R-8B ①	P9213 ②	
	② .46A	.066ADC	② 3.1A							

① Tape extra 5V winding.
② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CAPEHART PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	7.8KΩ	3.5Ω	650307B-1		A-3032				

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CAPEHART PART No.	VIKING PART No.	QUAM PART No.	
SP1	12"	PM	3.5Ω	850129A-1	12J11	12A31	① 5" PM Tweeter used in Model RP-254
SP2	5"	PM	3.5Ω	750519A-1 ①			

CHASSIS—BOTTOM VIEW

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAPEHART PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		453383A-1				
L2	Fil. Choke	.4Ω		452864A-1	19-1003		4608	4 Microhenries
L3	FM RF Coil	0Ω		453382B-1				
L4	FM Osc. Coil	0Ω		453379B-1				
L5	AM Ant. Coil	.5Ω		650664B-1				
L6	AM RF Coil	6Ω	4.5Ω *	650727B-1	14-1076			
L7	AM Osc. Coil	1Ω	5Ω	650729A-1	14-1074	BC-381	71-Osc.	
L8	CathodeChoke	.4Ω		452864A-1	19-1003		4608	4 Microhenries
L9	1st FM IF	.6Ω	.6Ω	452027A-1	16-3487	FM-254	1463	
L10	AM Input IF	14Ω	14Ω	452243A-1	16-6758	BC-352	12-C1	
L11	2nd FM IF	.6Ω	.6Ω	452027A-1	16-3487	FM-254	1463	
L12	AM Output IF	12Ω	12Ω	452177A-1	16-6758	BC-353	12-C2	
L13	Ratio Detector	1.5Ω	.8ΩCT	452028A-1	17-3487 ■	FM255	1465	Tertiary winding .4Ω
L14A	Line Choke	0Ω		453381A-1				
B	Line Choke	0Ω		453381A-1				

* Tapped @ 1.5Ω.
■ Drill mounting holes.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								REMARKS
	CAPEHART PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A65MG A62A	46-T	0-1 or S-1 and S-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	CAPEHART PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		* W-17 or † W-15 and * W-16 or † W-14	* W-378 or † A-376 or ♦ A-376D and * C-377 or † C-375 or ♦ C-375D	* W-11MGA and * W-11A	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M3	Dial light		Bayonet, #44
M4	Dial light		Bayonet, # 44
M5	Tuning cap.	750413A-1	19-328MMF; 26-290MMF; 15-157MMF
M6	Switch	750410B-1	Band
	Knob	452681A-3	Volume-on-off, tuning & tone
	Knob	453574A-3	Band switch
	Dial glass	650666A-1	
	Pointer	452208A-1	

DAVID BOGEN
MODEL J50

MIKE 1 VOLUME CONTROL

MIKE 2 VOLUME CONTROL

PHONO VOLUME CONTROL

BASS CONTROL

TREBLE CONTROL ON-OFF SWITCH

DAVID BOGEN
MODEL J50

TRADE NAME	David Bogen Model J50
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N.Y.
TYPE SET	AC Operated 3 Channel 50 Watt Audio Amplifier
TUBES (Nine)	Types (3) 6SF5 Pre-Amp., 6SL7GT AF Amp-Phase Inv., 6SN7GT Driver, (2) 807G Output, 5Y3GT Rectifier, 5U4G Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.46 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DAVID BOGEN MODEL J50

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	Mic-Pre-Amp.	6SF5	6SF5	6AB	
V2	Mic-Pre-Amp.	6SF5	6SF5	6AB	
V3	AF Amplifier	6SF5	6SF5	6AB	
V4	AF Amplifier - Phase Inverter	6SL7GT	6SL7GT	8BD	
V5	Driver	6SN7GT	6SN7GT	8BD	
V6	Audio Output	807G	807G	5AW	
V7	Audio Output	807G	807G	5AW	
V8	Rectifier	5Y3GT	5Y3GT	5T	
V9	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	8	500		PRS500/8		EB10023				
B	8	500		PRS500/8						
C2	4	600		GL600/4		KR604C		HS691	AP-46	
C3A	▬5	450		AFH4-09		D008		WP433.6	R1424	
B	■5	450								
C	▲5	450								
D	5	450								
C4	50	50		PRS50/50		BR505		TC39	TVA-1308	
C5	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C6	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C7	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C8	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C9	.033	400		P488-03		CUB4S3		PT413	4TM-S3	
C10	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C11	.033	400		P488-03		CUB4S3		PT413	4TM-S3	
C12	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C13	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C14	5000	500								
C15	.006	600		P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C16	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	
C17	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	
C18	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	
C19	.047	600		689ZX-047	DF-503	PJ6S47		PT6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Microphono No. 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Microphono No. 2
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Phonograph -volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	4Meg	½	V129E		AT-128			Bass - tapped @ 45KΩ
B	Shaft		Not Req.		FS-3			Attach to R4A
R5A	500KΩ	½	V149B	Q13-133	A47-500K-Z	B-60-S	U-48	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R5A

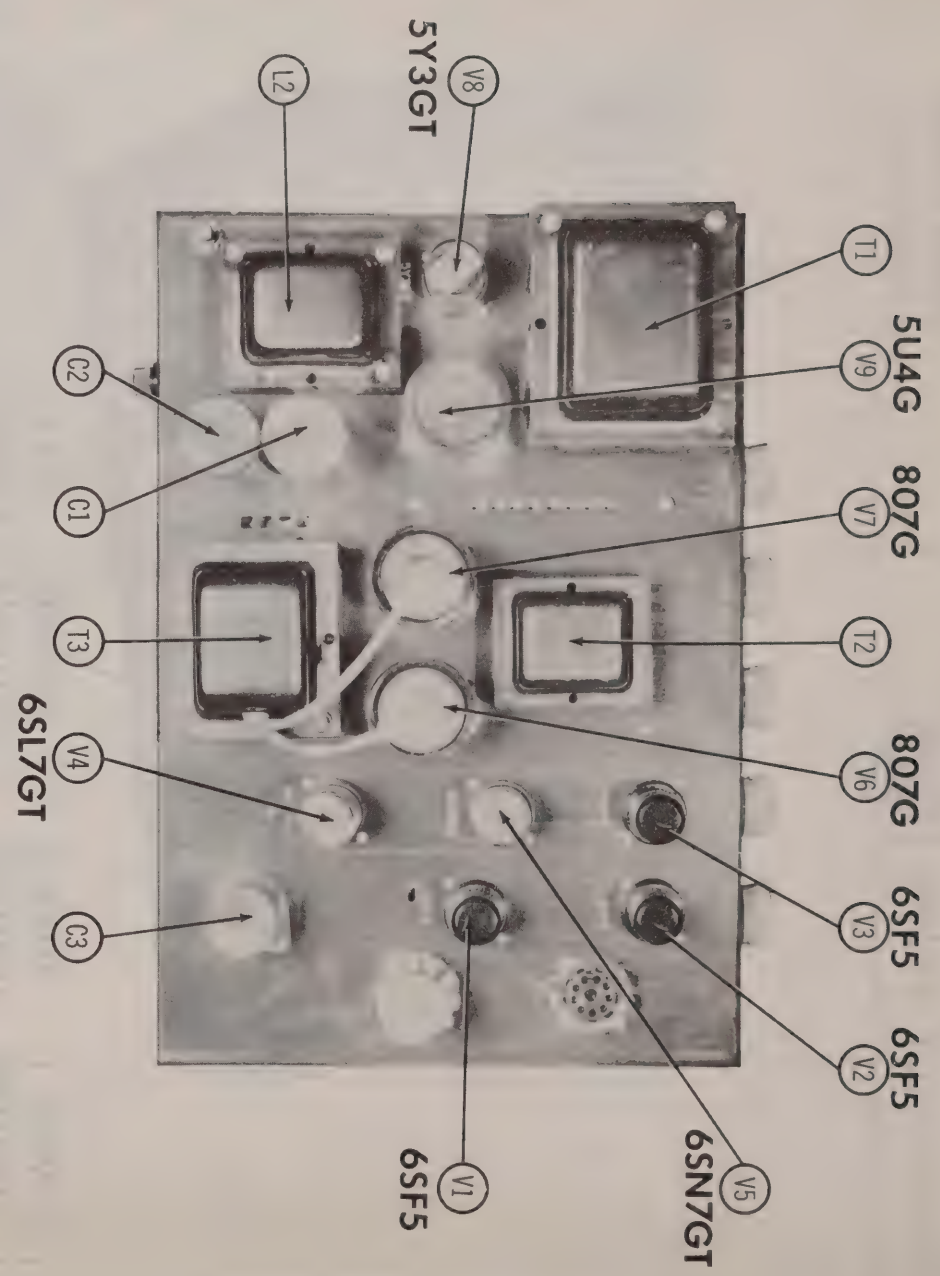
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R6	2.2Meg	½		BTS-2.2Meg	
R7	220KΩ	½		BTS-220K	
R8	2.2Meg	½		BTS-2.2Meg	
R9	220KΩ	½		BTS-220K	
R10	100KΩ	½		BTS-100K	
R11	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R12	220KΩ	½		BTS-220K	
R13	220KΩ	½		BTS-220K	
R14	330KΩ	½		BTS-330K	
R15	1000Ω	½		BTS-1000	
R16	220KΩ	½		BTS-220K	
R17	3.3Meg	½		BTS-3.3Meg	

(CONT'D ON NEXT PAGE)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R18	330Ω	½		BTS-330	
R19	3300Ω	½		BTS-3300	
R20	220KΩ	½		BTS-220K	
R21	100KΩ	½		BTS-100K	
R22	150KΩ	½		BTS-150K	
R23	3900Ω	½		BTS-3900	
R24	220KΩ	½		BTS-220K	
R75	22KΩ	½		BTS-22K	
R76	10KΩ	½		BTS-10K	
R27	47KΩ	2		BTB-47K	
R28	3.3Meg	½		BTS-3.3Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R29	1500Ω	½		BTS-1500	
R30	1500Ω	1		BTS-1500	
R31	1500Ω	2		BTB-1500	
R32	470KΩ	½		BTS-470K	
R33	470KΩ	1		BTS-470K	
R34	1000Ω	2		BTB-1000	
R35A	10KΩ	50			
B	40KΩ				
R36	1000Ω	20		2½DA-1000	
R37	4.7Ω	½			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @1.46A	1180VCT .130ADC	616VCT .049ADC @3A SEC. 4 5VAC @2A	5VAC @3A SEC. 5 6.3VCT 5.1A	T361-2					

TRANSFORMER (INPUT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T2	142ΩCT				T119					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T3	2.7KΩ CT	140V tap @ 70V SEC. 2 15Ω tap @ 8Ω @ 4Ω	T256						

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L1	.049ADC	190Ω	5.5HY	T501	C-1706	C-2975		C5007	
L2	.130ADC	51.6Ω	2.8HY	T-510	C-2304		C-13X		

FUSES

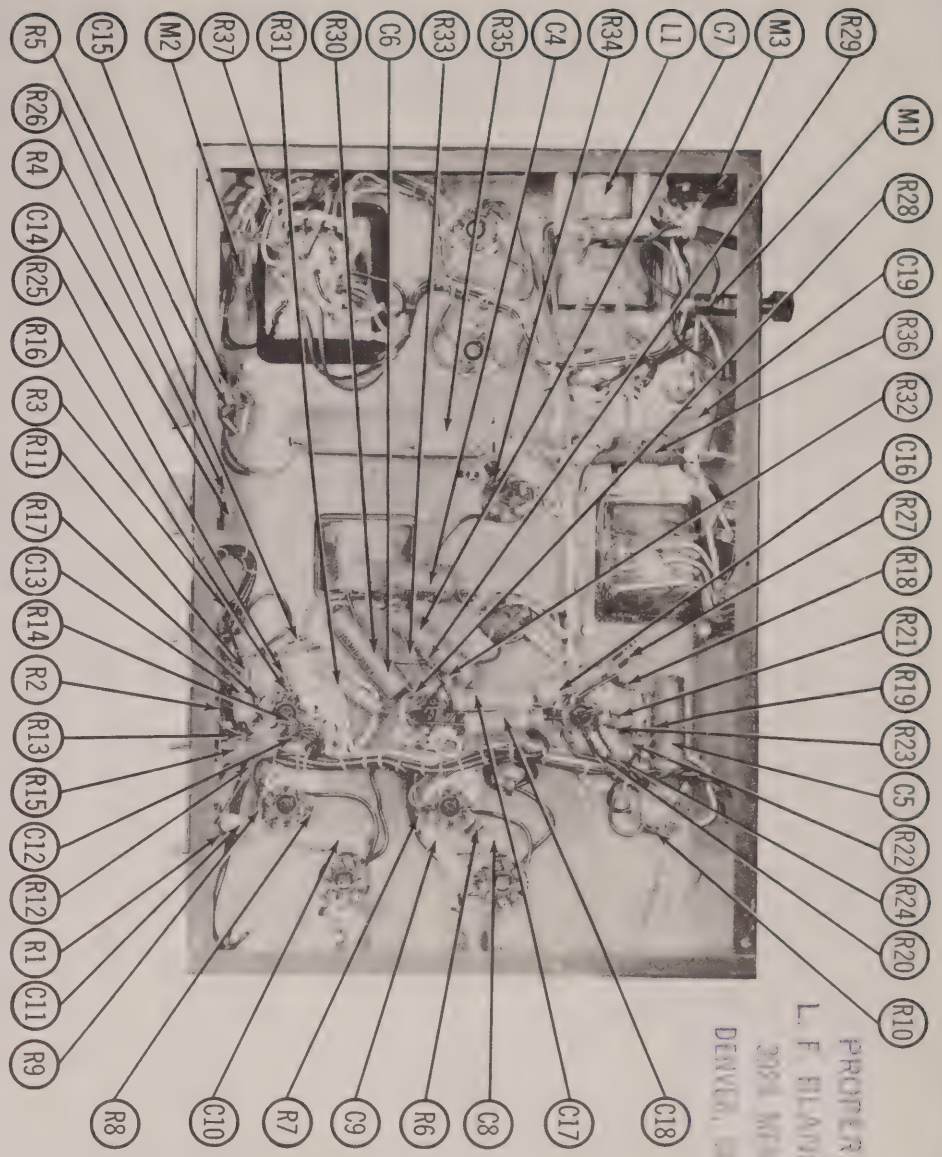
ITEM No.	TYPE	RATING	REPLACEMENT DATA David Bogen PART No. FUSE	David Bogen PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	3A 125V			318003. (3AG S/B-3A)	342001	MDL3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M2	Dial light		# 47
M3	Switch		Interlock

SET 258 FOLDER 5

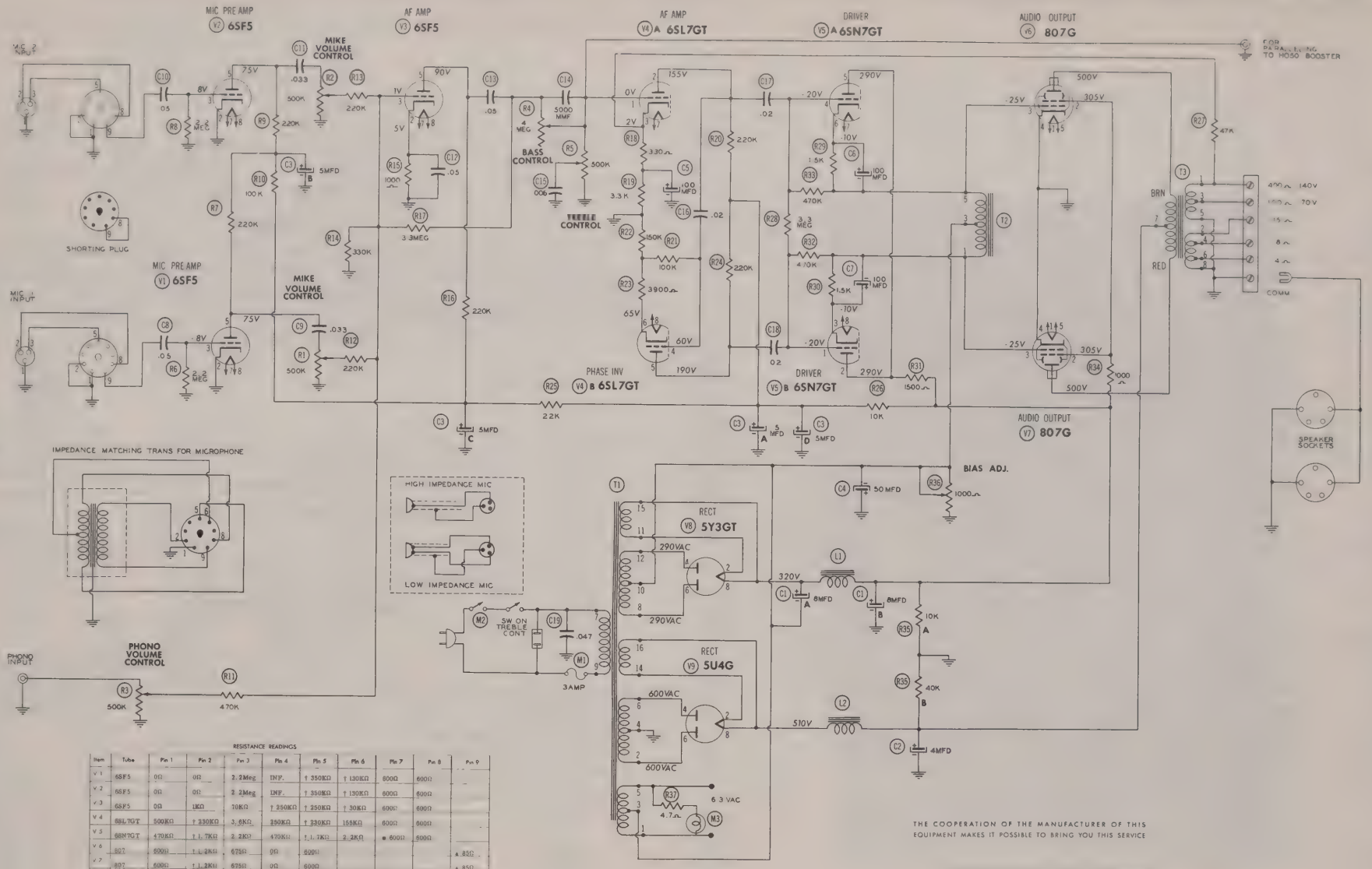
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. HAMMOND
3061 MYRTLE ST.
DENVER, COLORADO

DAVID BOGEN MODEL 750

DAVID BOGEN MODEL 750



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6SF5	0Ω	0Ω	2.2Meg	INF.	↑ 350KΩ	↑ 130KΩ	600Ω	600Ω	
V 2	6SF5	0Ω	0Ω	2.2Meg	INF.	↑ 350KΩ	↑ 130KΩ	600Ω	600Ω	
V 3	6SF5	0Ω	1KΩ	70KΩ	↑ 250KΩ	↑ 250KΩ	↑ 30KΩ	600Ω	600Ω	
V 4	6SL7GT	500KΩ	↑ 330KΩ	3.6KΩ	350KΩ	↑ 330KΩ	155KΩ	600Ω	600Ω	
V 5	6SN7GT	470KΩ	↑ 1.7KΩ	2.2KΩ	470KΩ	↑ 1.7KΩ	2.2KΩ	∞ 600Ω	600Ω	
V 6	807	600Ω	↑ 1.2KΩ	675Ω	0Ω	600Ω				▲ 85Ω
V 7	807	600Ω	↑ 1.2KΩ	675Ω	0Ω	600Ω				▲ 85Ω
V 8	5Y3GT	INF.	10KΩ	INF.	700Ω	INF.	700Ω	INF.	10KΩ	
V 9	5U4G	INF.	40KΩ	INF.	40Ω	INF.	40Ω	INF.	40KΩ	

▲ MEASURED FROM PIN 8 OF V9
↑ MEASURED FROM PIN 8 OF V8

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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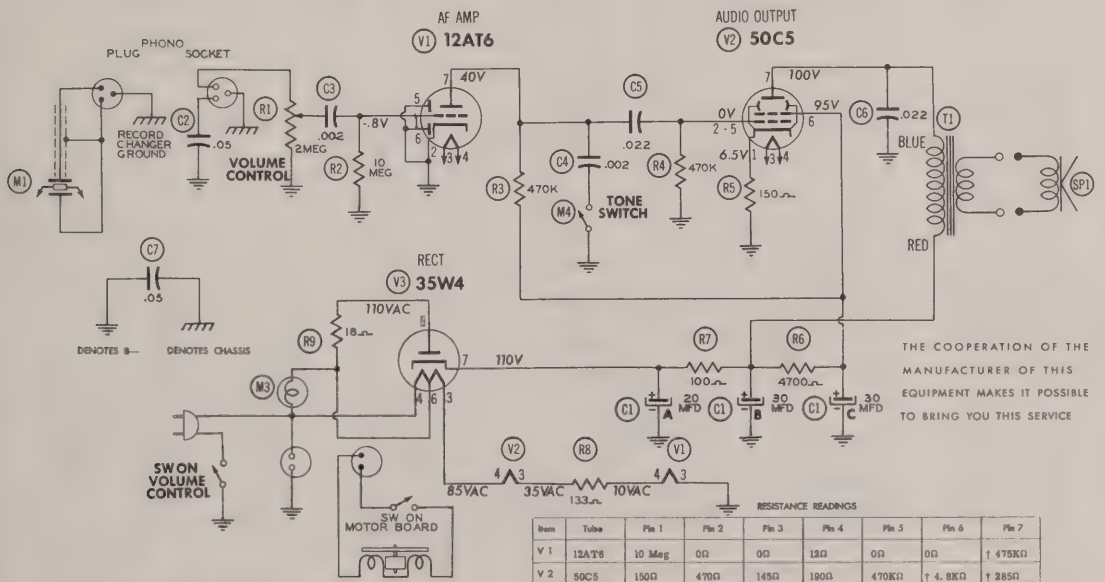
PROPERTY OF
E. F. BLANKENSHIP
3924 WEAVER ST
DENVER, COLO.

EMERSON
MODEL 789B (Ch. 120207-B)

EMERSON
MODEL 789B (Ch. 120207-B)

TRADE NAME	Emerson Model 789B (Ch. 120207-B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eight Ave., New York, N. Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 819073- SEE SIMILAR V-M MODEL 950-PHOTOFACT SET #216 - FOLDER # 11 OR RECORD CHANGER MANUAL CM-5.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	10 Meg	0Ω	0Ω	13Ω	0Ω	0Ω	† 475KΩ
V 2	50C5	150Ω	470Ω	145Ω	190Ω	470KΩ	† 4. 8KΩ	† 285Ω
V 3	35W4	† 100Ω	† 4. 8KΩ	190Ω	220Ω	235Ω	225Ω	200KΩ

† MEASURED FROM PIN 7 OF V3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	12AT6	12AT6	7BT	
V2	Audio Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	20	150	925246	PR150/30-30		BBRT-		3N534	TVA-3444	Red
B	30	150		-30		-33315				Brown
C	30	150								Green
C2	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	.002	600	923723	P688-002	D6-202	CUB6D2	GP2L-202	PT622	6TM-D2	
C4	.002	600	923723	P688-002	D6-202	CUB6D2	GP2L-202	PT622	6TM-D2	
C5	.022	400	922524	P488-022		CUB4S22		PT4122	4TM-S22	
C6	.022	400	P22524	P488-022		CUB4S22		PT4122	4TM-S22	
C7	.05	400	923554	489ZX-05	DF-503	CUB3S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2 Meg	½	390239	Q11-139	A47-2Meg-S	AB-75	U-56	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	EMERSON PART No.	IRC PART No.	NOTES
R2	10 Meg	½	351452	BTS-10 Meg	
R3	470KΩ	½	351132	BTS-470K	
R4	470KΩ	½	351132	BTS-470K	
R5	150Ω	½	340292	BTS-150	

ITEM No.	RATING: OHMS	RATING: WATT	EMERSON PART No.	IRC PART No.	NOTES
R6	4700Ω	½	350652	BTS-4700	
R7	100Ω	1	370252	BTA-100	
R8	133Ω 5%	5	394144		
R9	18Ω	½	340072	BTS-18	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	EMERSON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.4Ω	734092	A-3332	A-3025	S-12X	Z1101	24S50 ①	① Drill one new mounting hole.

SPEAKER

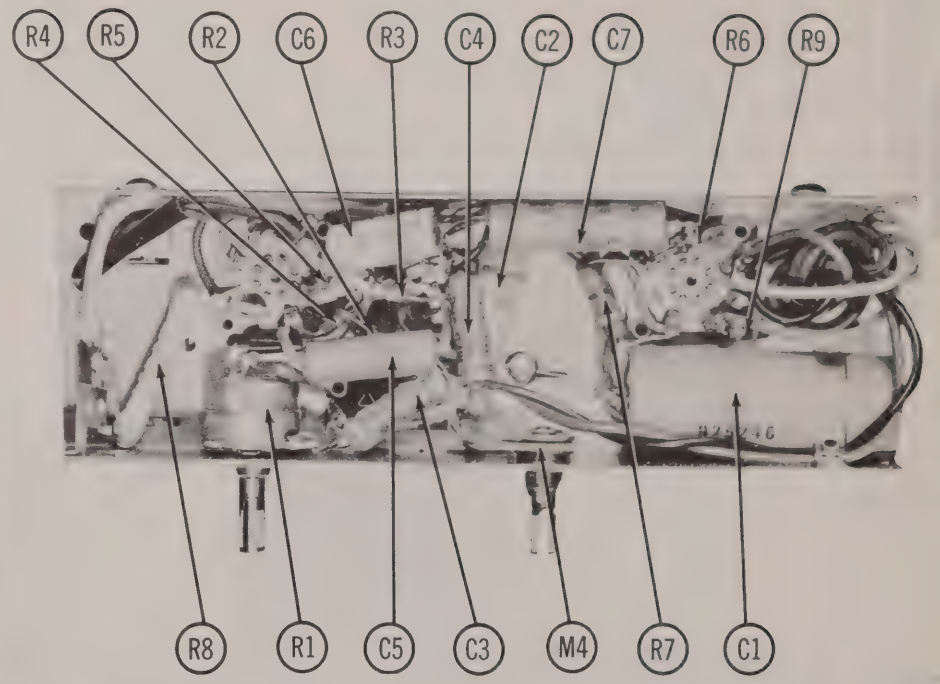
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.4Ω	180095	ST-108 Mod. P6-X	6A1	

PHONO CARTRIDGE

ITEM No.	EMERSON PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	960776	AC-DC	A-1 A-3	WC24	A53MG A52A	46	0-1 or S-1 and 0-3 or S-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	EMERSON PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	960777 78RPM Needle	* JP-32 or † JPS-32	* C-414 or † C-420 or ♦ C-420D	* W-31A or † W-31S	* Metal † Jewel ♦ Diamond
	960778 33 1/3-45RPM Needle	.* JP-32LP or † JPS-32LP	* A-415 or † A-418 or ♦ A-418D	* W-31MGA or † W-31MGS	

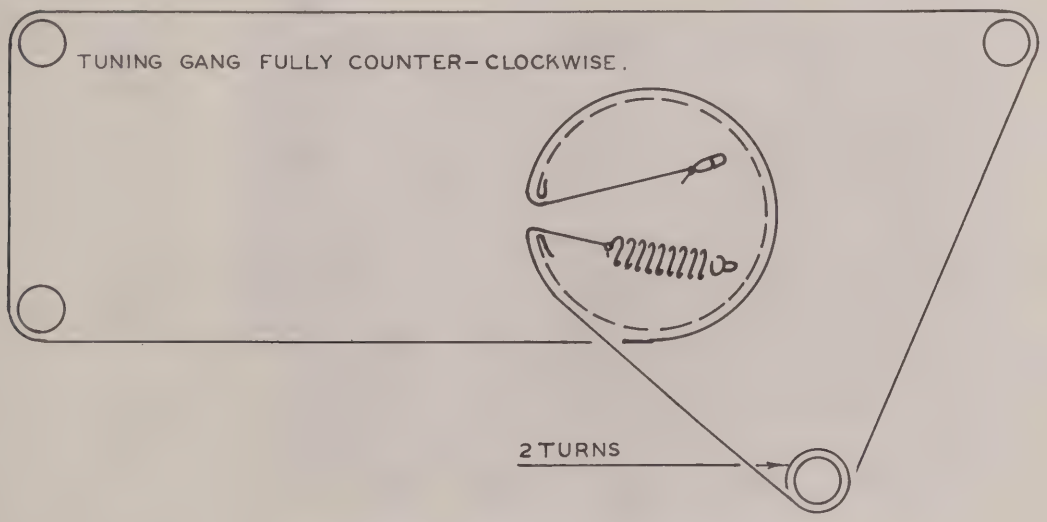
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Dial light	807000	# 47 bayonet
M4	Switch	510034	Tone
	Changer	819073	
	Cabinet	140568	Brown leatherette
	Cabinet	140568A	Blue-gray leatherette
	Cabinet	140568B	Green two-tone leatherette
	Knob	460533A	Off-volume
	Knob	460533B	Tone

PROPERTY OF
L. F. BLANKENSHIP
924 MEADE ST.
DENVER, COLORADO

FISHER
MODEL 70RT

TRADE NAME	Fisher Model 70-RT	
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City, 1, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installation	
TUBES	Fifteen	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .37 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620 KC	FREQ. MOD. 88-108MC



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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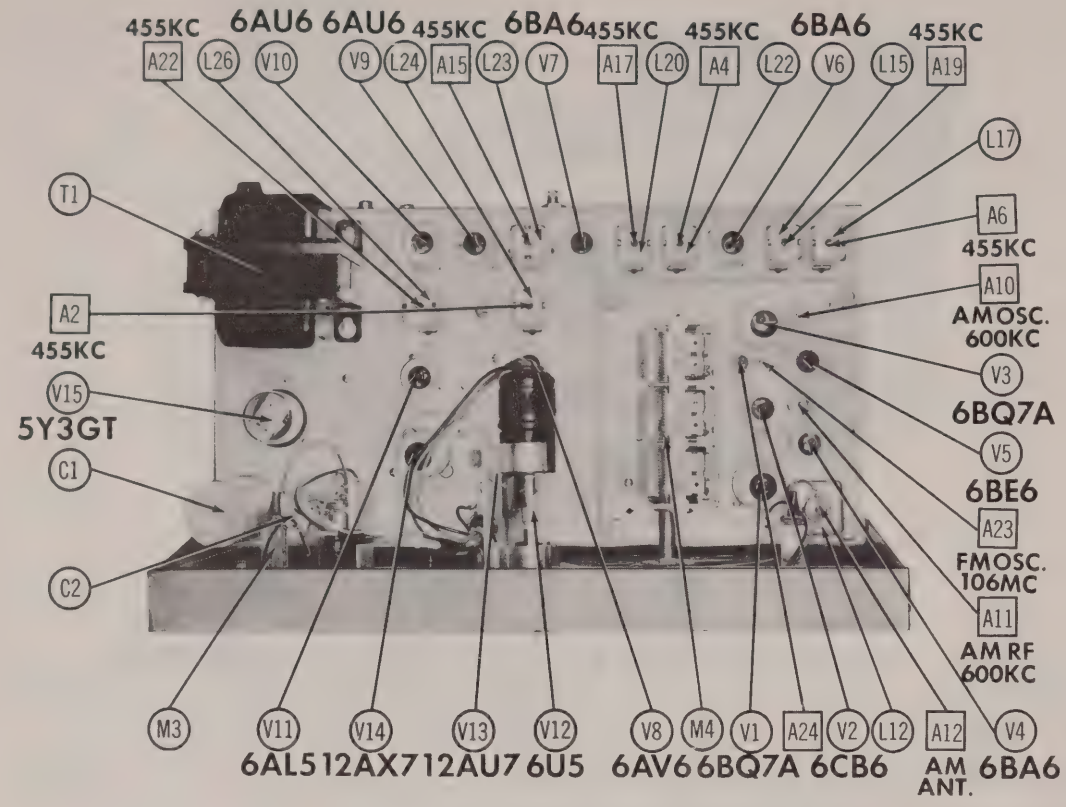
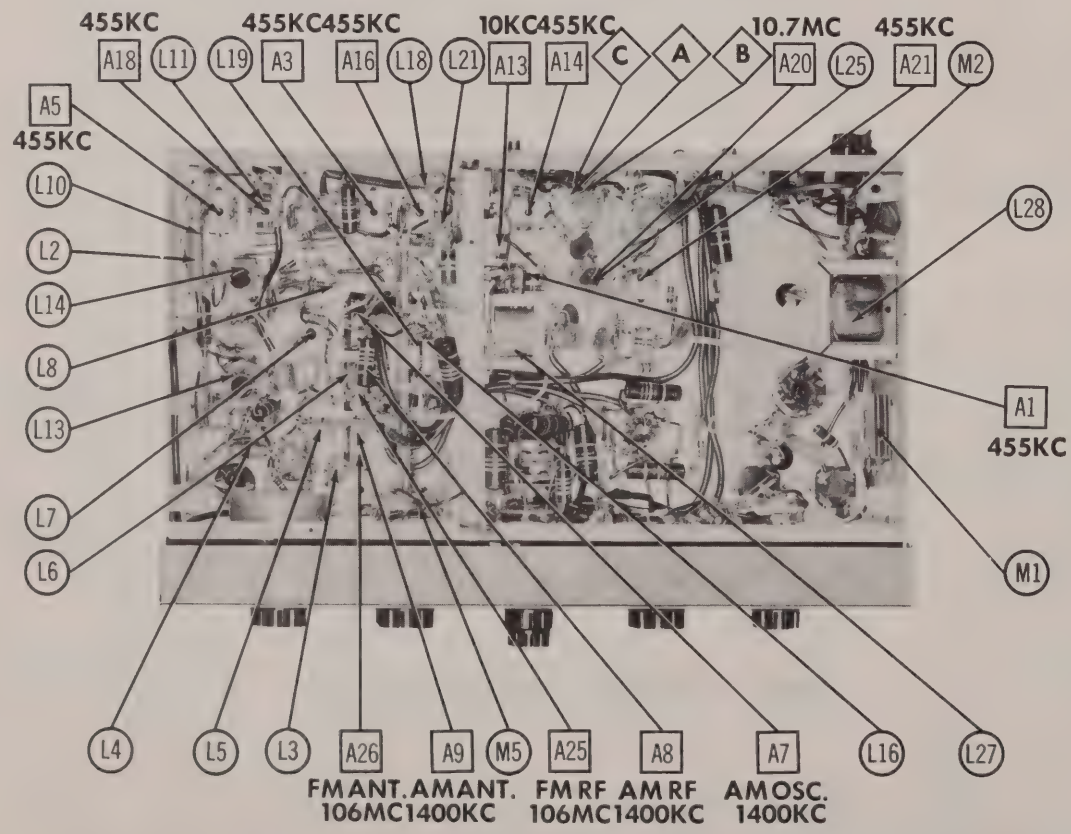
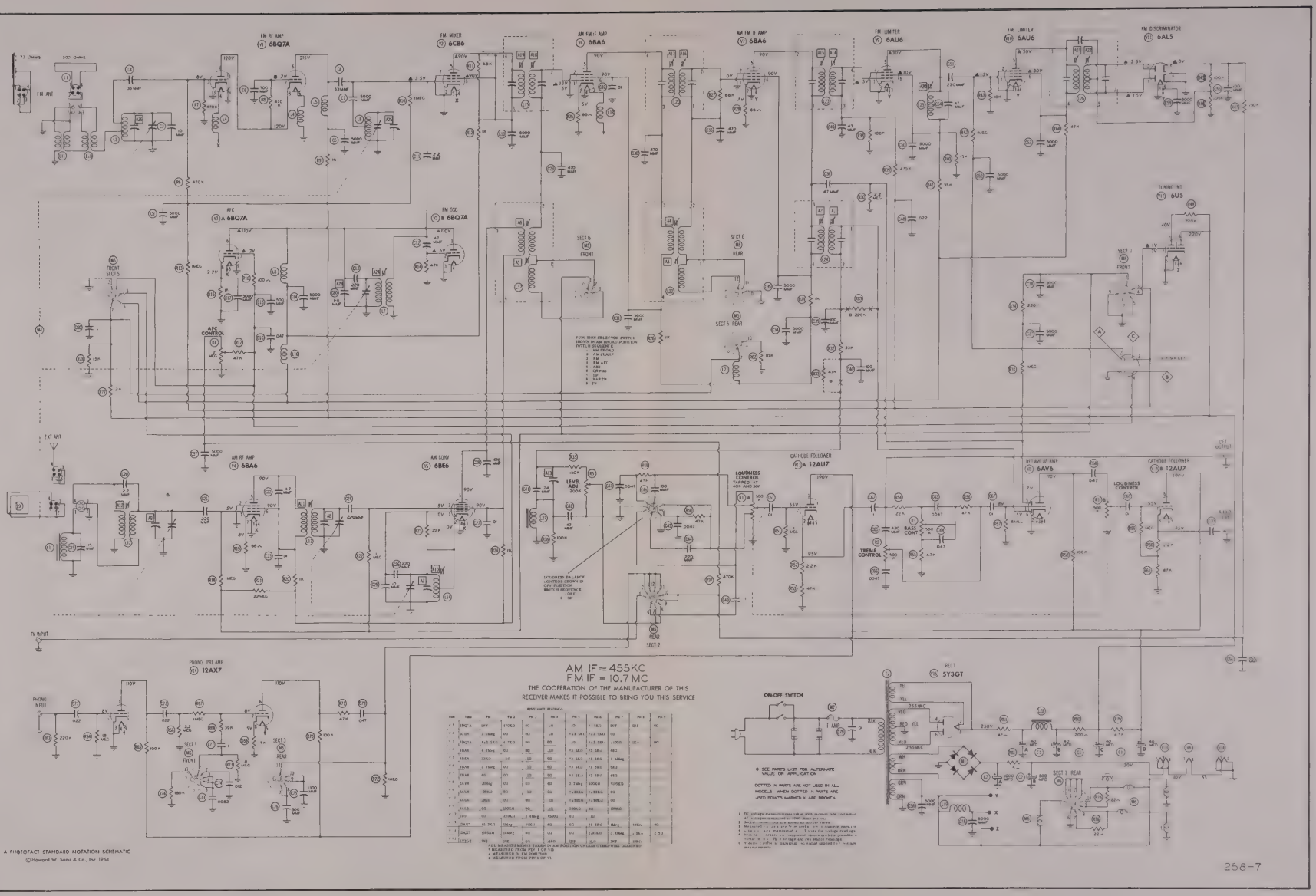


CHASSIS TOP VIEW



CHASSIS-BOTTOM VIEW- ALIGNMENT IDENTIFICATION


AM IF = 455KC
FM IF = 10.7 MC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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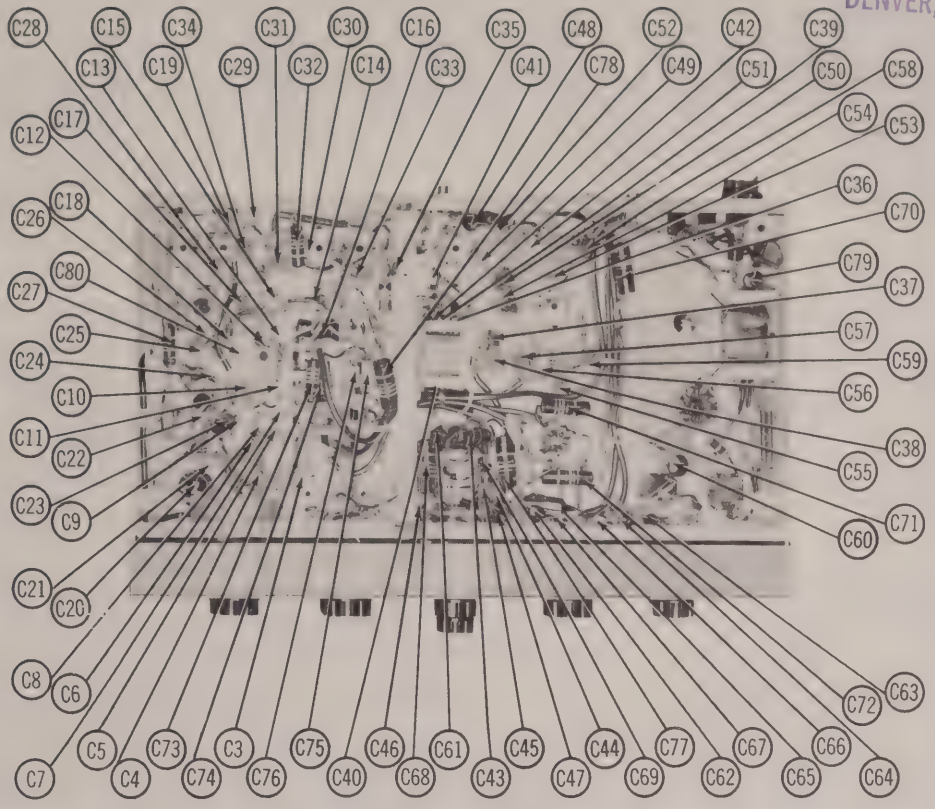
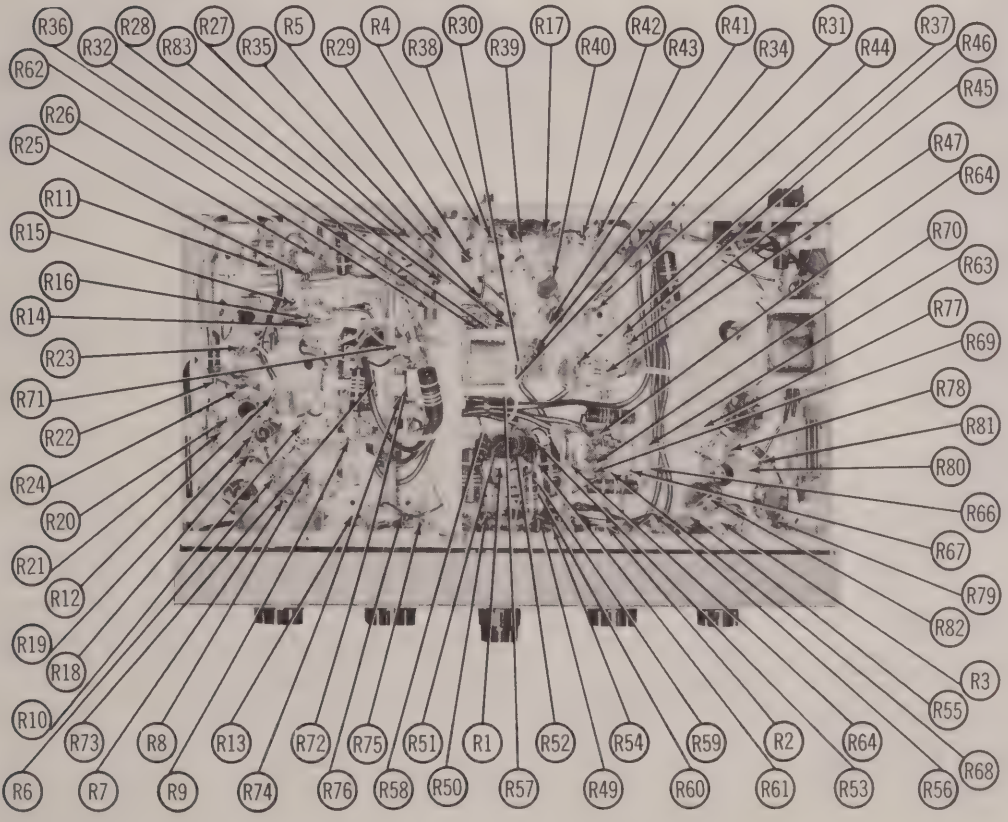
258-7

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (400∿Mod)	AM Sharp	1000KC (Approx)	Across detector output jack	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	"	"	455KC (FM Mod 30KC Swp)	AM Broad	"	Use scope. Vert. Amp. across detector output jack	A1	SLIGHTLY retouch A1 for symmetrical response on scope. If necessary equipment is not available omit this step.
3.	200MMF	High side to pin 4 of AM antenna jack. (Short pin 1 to pin 3 of AM antenna jack). Low side to chassis.	1400KC	AM Sharp	1400KC	Across detector output jack	A7, A8 A9	Disconnect AM loop antenna. Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A10, A11, A12	Adjust for maximum output. Repeat steps 3 and 4.
5.	.01MFD	High side to pin 6 (diode plate) of 6AV6 (V8A). Low side to chassis.	10KC	"	"	"	A13	Alternately adjust A13 and R5A (level adj) for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set AFC control (R4A) fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over 6CB6 (V2). Low side to chassis.	10.7MC (Unmod)	FM-AFC	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A14, A15 A16, A17 A18, A19 A20	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A21	SLIGHTLY detune A22 then adjust A21 for maximum deflection.
8.	"	"	"	"	"	"	A22	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Set AFC control (R4A) fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over 6CB6 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM-AFC	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A14, A15 A16, A17 A18, A19 A20	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A21, A22	Adjust A22 so that 10.7MC occurs at center of crossover lines as in Fig. 2. Adjust A21 for maximum amplitude and straightness of crossover lines. Continue alignment with step 9.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across pins 1 and 4 of FM antenna jack with 120Ω in each lead (short pin 2 to pin 3 of FM antenna jack)	106MC (Unmod)	FM	106MC	DC probe to point Ⓒ. Common to chassis.	A23	Adjust for maximum deflection.
10.	"	"	90MC	"	90MC	"	A24	Adjust for maximum deflection. Repeat steps 9 and 10.
11.	"	"	106MC	"	Tune to 106MC signal	"	A25 A26	Adjust for maximum deflection.
12.	"	"	90MC	"	Tune to 90MC signal	"	L3, L6	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 11 and 12.

FIG. 1

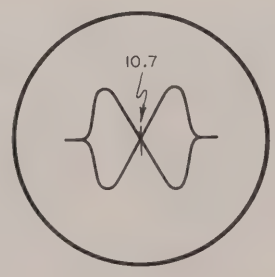


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: FISHER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	FM RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	FM Mixer	6CB6	6CB6	7CM	
V3	FM Osc.-AFC	6BQ7A	6BQ7A	9AJ	
V4	AM RF Amp.	6BA6	6BA6	7BK	
V5	AM Converter	6BE6	6BE6	7CH	
V6	AM FM IF Amp.	6BA6	6BA6	7BK	
V7	AM FM IF Amp.	6BA6	6BA6	7BK	
V8	AM Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V9	FM Limiter	6AU6	6AU6	7BK	
V10	FM Limiter	6AU6	6AU6	7BK	
V11	FM Disc.	6AL5	6AL5	6BT	
V12	Tuning Inductor	6U5	6U5	6R	
V13	Cathode Follower	12AU7	12AU7	9A	
V14	Phono Pre-Amp.	12AX7	12AX7	9A	
V15	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	C505-120	AFH3-44		D046		FP377	R1327	
B	■40	300		PRS450/40		BR4035		TC78		
C	▲40	300								
D	40	300								
C2A	▲1000	25	C505-132	AFH1-08		A013		WP059	R1550	
B	▲500	25		AFH1-10		BRH255		TC2505		
C3	10		C-1317	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C4	33		C-3337	SI33	D6-330	TP27	GP1K-330	UC-5433	5GA-Q33	
C5	5000		C-3338	SI5000	D6-502	TP64	GP2-333-502	UC-525	5GA-D5	
C6	500		C-1315	SI500	D6-501	TP47	GP2L-501	UC-535	5GA-T5	
C7	5000		C-3338	SI5000	D6-502	TP64	GP2-333-502	UC-525	5GA-D5	
C8	33		C-3337	SI33	D6-330	TP27	GP1K-330	UC-5433	5GA-Q33	
C9	5000		C-2146	SI5000	D6-502	TP64	GP2-333-502	UC-525	5GA-D5	
C10	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C11	2.2		C-3039	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C12	47		C-3350	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C13	220		C-3306	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C14	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C15	500		C-1315	SI500	D6-501	TP47	GP2L-501	UC-545	5GA-T5	
C16	.047	400	C-2944	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C17	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C18	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C19	15		C-1316	SI15NP0	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C20	2.2		C-3039	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C21	220		C-3306	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C22	4.7		C-1779	SI4.7NP0	TCZ-4.7	TZ07	NP0K-4R7	ZT-5547	5TCCB-V47	
C23	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C24	220		C-3306	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C25	10		C-2851	SI10N750	TCN-10	TN01	N750K-100	NT-541	5TCU-Q15	
C26	220		C-3306	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C27	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C28	470	500	C-3334	1469-0005		5W5T47		MCE-245	MS-35	
C29	470	500	C-3334	1469-0005		5W5T47		MCE-245	MS-35	
C30	470	500	C-3334	1469-0005		5W5T47		MCE-245	MS-35	
C31	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C32	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C33	470	500	C-3334	1469-0005		5W5T47		MCE-245	MS-35	
C34	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C35	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C36	47		C-3350	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C37	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C38	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C39	100		C-3339	SI100	D6-101	TP34	GP2K-101	UC-531	5GA-T1	
C40	100		C-3339	SI100	D6-101	TP34	GP2K-101	UC-531	5GA-T1	
C41	24		C-3392							
C42	47		C-3411	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C43	.1	200	C-3369	P288-1	DF-104	PJ2P1		PT401	2TM-P1	

PARTS LIST & DESCRIPTION (continued)

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	220		C-3407	SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C45	.0047	400	C-3304							
C46	100		C-3339	SI100	D6-100	TP34	GP1K-101	UC-531	5GA-T1	
C47	.0047	400	C-3304							
C48	.022	400	C-2946	P488-022		CUB4S22		PT4122	4TM-S22	
C49	47		C-3350	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C50	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525		
C51	220		C-3306	SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C52	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C53	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C54	47		C-3350	SI47NP0	TCZ-47	TZ22	NP0K-470		5TCC-Q47	
C55	100		C-3339	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C56	800		C-3309							
C57	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C58	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C59	5000		C-2146	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C60	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C61	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C62	.1	200	C-3369	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C63	.0047	400	C-3304							
C64	.047	400	C-2944	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C65	420		C-3308							
C66	.0047	400	C-3304							
C67	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C68	.047	400	C-2944	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C69	.01	400	C-3155	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C70	.1	200	C-3369	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C71	.022	400	C-2946	P488-022		CUB4S22		PT4122	4TM-S22	
C72	.022	400	C-2946	P488-022		CUB4S22		PT4122	4TM-S22	
C73	.0082	400	C-3303							
C74	.012	400	C-3414							
C75	1300		C-3307							
C76	800		C-3309							
C77	.1	200	C-3369	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C78	.047	400	C-2944	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C79	.01	600	C-2747	689ZX-01	D6-103	PJ6S1	GP2-333-103	PT611	6TM-S1	
C80	1-8		C-2970							

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FISHER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	3263					Volume & loudness switch-tapped @ 40KΩ & 30KΩ-Panel
B	500KΩ	½						Volume & loudness -Rear-Note
R2A	500KΩ	½	R-50000-2	Q13-133	A47-500K-S	B-60	U-48	Treble
B	Shaft		Not Req.	Not Req.	RS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	R-5000-3	Q13-133	A47-500K-Z	B-60-S	U-48	Bass
B	Shaft		Not Req.	Not Req.	RS-3	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R3A
R4A	2Meg	½	R-2815-12	Q11-139	A47-2Meg-S	AB-75	SU-56	AFC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	200KΩ	½	R-50000-4	Q11-129	A47-200K-S	AB-46	U-43	Level Adjustment
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R5A

Note: Some models may use an alternate control part #RS-513-121.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FISHER PART No.	IRC PART No.	NOTES
R6	470KΩ	½	RC20BF474K	BTS-470K	
R7	470KΩ	½	RC20BF474K	BTS-470K	
R8	470KΩ	½	RC20BF474K	BTS-470K	
R9	1000Ω	½	RC20BF102K	BTS-1000	
R10	1Meg	½	RC20BF105K	BTS-1Meg	
R11	68KΩ	½	RC20BF683K	BTS-68K	
R12	1000Ω	½	RC20BF102K	BTS-1000	
R13	1Meg	½	RC20BF105K	BTS-1Meg	
R14	4700Ω	½	RC20BF472K	BTS-4700	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FISHER PART No.	IRC PART No.	NOTES
R15	1000Ω	½	RC20BF102K	BTS-1000	
R16	100Ω	½	RC20BF101K	BTS-100	
R17	47KΩ	½	RC20BF473K	BTS-47K	
R18	1Meg	½	RC20BF105K	BTS-1Meg	
R19	68Ω	½	RC20BF680K	BTS-68	
R20	1000Ω	½	RC20BF102K	BTS-1000	
R21	22Meg	½	RC20BF226K	BTS-22Meg	
R22	1Meg	½	RC20BF105K	BTS-1Meg	
R23	22KΩ	½	RC20BF226K	BTS-22K	

(CONT'D ON NEXT PAGE)

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PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FISHER PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R24	1000Ω	½	RC20BF102K	BTS-1000	
R25	68Ω	½	RC20BF680K	BTS-68	
R26	1000Ω	½	RC20BF102K	BTS-1000	
R27	68KΩ	½	RC20BF683K	BTS-68K	
R28	68Ω	½	RC20BF680K	BTS-68	
R29	1000Ω	½	RC20BF102K	BTS-1000	
R30	2.2Meg	½	RC20BF225K	BTS-2.2Meg	
R31	1Meg	½	RC20BF105K	BTS-1Meg	
R32	33KΩ	½	RC20BF333K	BTS-33K	
R33	47KΩ	½	RC20BF473K	BTS-47K	Note 1
R34	220KΩ	½	RC20BF224K	BTS-220K	
R35	150KΩ	½	RC20BF154K	BTS-150K	
R36	100KΩ	½	RC20BF104K	BTS-100K	
R37	470KΩ	½	RC20BF474K	BTS-470K	
R38	100KΩ	½	RC20BF104K	BTS-100K	
R39	470KΩ	½	RC20BF474K	BTS-470K	
R40	15KΩ	½	RC20BF153K	BTS-15K	
R41	33KΩ	½	RC20BF333K	BTS-33K	
R42	1Meg	½	RC20BF105K	BTS-1Meg	
R43	10KΩ	½	RC20BF103K	BTS-10K	
R44	47KΩ	½	RC20BF473K	BTS-47K	
R45	100KΩ	½	RC20BF104K	BTS-100K	
R46	100KΩ	½	RC20BF104K	BTS-100K	
R47	150KΩ	½	RC20BF154K	BTS-150K	
R48	220KΩ	½	RC20BF224K	BTS-220K	
R49	47KΩ	½	RC20BF473K	BTS-47K	
R50	47KΩ	½	RC20BF473K	BTS-47K	
R51	1Meg	½	RC20BF105K	BTS-1Meg	
R52	2200Ω	½	RC20BF222K	BTS-2200	
R53	47KΩ	½	RC20BF473K	BTS-47K	
R54	22KΩ	½	RC20BF223K	BTS-22K	
R55	4700Ω	½	RC20BF472K	BTS-4700	
R56	47KΩ	½	RC20BF473K	BTS-47K	
R57	18Meg	½	RC20BF186K	BTS-18Meg	
R58	100KΩ	½	RC20BF104K	BTS-100K	
R59	1Meg	½	RC20BF105K	BTS-1Meg	
R60	2200Ω	½	RC20BF222K	BTS-2200	
R61	47KΩ	½	RC20BF473K	BTS-47K	
R62	10KΩ	2	RC20BF103K	BTB-10K	
R63	220KΩ	½	RC20BF224K	BTS-220K	
R64	18Meg	½	RC20BF186K	BTS-18Meg	
R65	100KΩ	½		BTS-100K	
R66	2.2Meg	½	RC20BF225K	BTS-2.2Meg	
R67	1Meg	½	RC20BF105K	BTS-1Meg	
R68	39KΩ	½	RC20BF393K	BTS-39K	
R69	1500Ω	½	RC20BF152K	BTS-1500	
R70	100KΩ	½	RC20BF104K	BTS-100K	
R71	47KΩ	½	RC20BF473K	BTS-47K	
R72	1Meg	½	RC20BF105K	BTS-1Meg	
R73	18Meg	½	RC20BF186K	BTS-18Meg	
R74	180KΩ	½	RC20BF184K	BTS-180K	
R75	22Ω	½	RC20BF220K	BTS-22	
R76	22Ω	½	RC20BF220K	BTS-22	
R77	2000Ω	10	R-3344	1 3/4A-2000	
R78	15KΩ	2	R-3332	BTB-15K	
R79	4700Ω	½	RC20BF472K	BTS-4700	
R80	200Ω	5	R-3342	1 3/4A-200	
R81	47Ω	1	R-3333		
R82	15Ω	2	R-3331		
R83	220KΩ	½		BTS-220K	Note 1

Note 1. Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FISHER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .37A	510VCT .087ADC	6.3VAC @ 3.8A	20VAC @ .024A	T509-122					

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FISHER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Loop			L-50003				
L2	FM Ant. Coil	.7Ω	.7Ω	L-509-139				
L3	FM Ant. Coil	0Ω		L-509-159				
L4	Fil. Choke	.2Ω		L-509-140	19-1002		4606	2.5 Microhenries; 2 coils on one form
L5	FM RF Choke	1.8Ω		L-3352	19-1002		4606	2.2 Microhenries; IRC Part No. CLA
L6	FM RF Coil	0Ω		L-509-162				
L7	FM Osc. Coil	0Ω		L-509-160				
L8	FM RF Choke	.5Ω		L-509-147	19-1003		4608	3.5 Microhenries
L10	AM Ant. Coil	.7Ω	.7Ω	L-509-139				
L11	AM Ant. Loading Coil	1.6Ω		L-509-135	19-7047	TV-180	6176	
L12	AM Ant. Coil	50Ω	3.7Ω	L-509-137	14-7413	BC-383	73-A	
L13	AM RF Coil	120Ω	4.2Ω	C-3309				
L14	AM Osc. Coil	4Ω		L-509-134	14-1060 *	BC-381 ■	71-Osc. *	Tapped @ .5Ω
L15	1st FM IF	.6Ω	.6Ω	ZZ-2987	16-3487	FM-254	1463	
L16	FM RF Choke	1.8Ω		L-3352	19-1002		4606	2.2 Microhenries; IRC Part No. CLA
L17	1st AM IF	6Ω	6Ω	ZZ-509-132				
L18	Fil. Choke	.44Ω		L-3351	19-3001		6175	.68 Microhenry; IRC Part No. CLA
L19	Fil. Choke	.2Ω		L-509-156	19-1000		4602	.9 Microhenry
L20	2nd FM IF	.6Ω	.6Ω	ZZ-2987	16-3487	FM-254	1463	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FISHER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L21	FM RF Choke	1.8Ω		L-3352	19-1002		4606	2.2Microhenries; IRC Part No. CLA
L22	2nd AM IF	5.5Ω	5.5Ω	ZZ-509-132				
L23	3rd FM IF	1.7Ω	.5Ω	ZZ-509-130	16-3487	FM-254	1463	
L24	3rd AM IF	8Ω	8Ω	ZZ-2984	16-6758	BC-353	12-C2	
L25	FM Limiter Coil	.3Ω		L-509-138				
L26	FM Disc.	.7Ω	1.1ΩCT	ZZ-509-131		FM-253	1464	

* Use primary winding and drill mounting holes.
■ Use secondary winding and drill mounting hole.

TONE CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA FISHER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L27		367Ω	2.37 Hy.	L515-115-2					

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA FISHER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L28	.087A	198Ω	4.7 Hy.	L509-128	C-2309 ①		C-15X ①	C5020 ①	20C49 ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA FISHER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.024ADC	SR-3078	1015	Q1B		304B		

FUSES

ITEM No.	TYPE	RATING	FISHER PART No. FUSE	FISHER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG Slo-Blo	1A 125V	F-3256		313001 (1A-3AG Slo-Blo)	342001	MDL1	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M3	Dial Light	I-2148	Bayonet #47 (6 used)
M4	Tuning Cap.	C-509-118	22-373MMF, 22-373MMF, 17-158MMF
M5	Switch		Selector

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Figure 1

GARRARD
MODEL RC90

GENERAL INFORMATION

The Garrard Model R. C. 90 Record Changer is desinged to play standard 78RPM, fine-groove 45RPM, or micro-groove 33 1/3RPM records of standard commercial dimensions. Records up to 12 inches in diameter can be played.

Features of Model R. C. 90 Changers include playing and automatically changing as many as 10 records, 10" or 12", not mixed. A full stack of ten 7", 33 1/3RPM records or a full stack of ten 7", 45RPM records (using the "45" Adaptor Spindle) will also play on this changer.

A short spindle for use when playing small hole records manually and an adaptor for playing large hole 45RPM records manually is supplied with the changer.

This changer automatically shuts off after the last record has been played.

Model R. C. 90 is suitable for use on 100/130 or 200/250 volts, at either 50 or 60 cycles according to the motor pulley supplied, and the links on the terminal block must be set to the correct position to correspond with the voltage of the power supply.

Manufactured by:

Garrard Engineering & Mfg. Co. Ltd.
Okus Road
Swindon, Wilts - England

U. S. Distributor:

Garrard Sales Corp.
164 Duane Street
New York 13, N. Y.

This material compiled and published by

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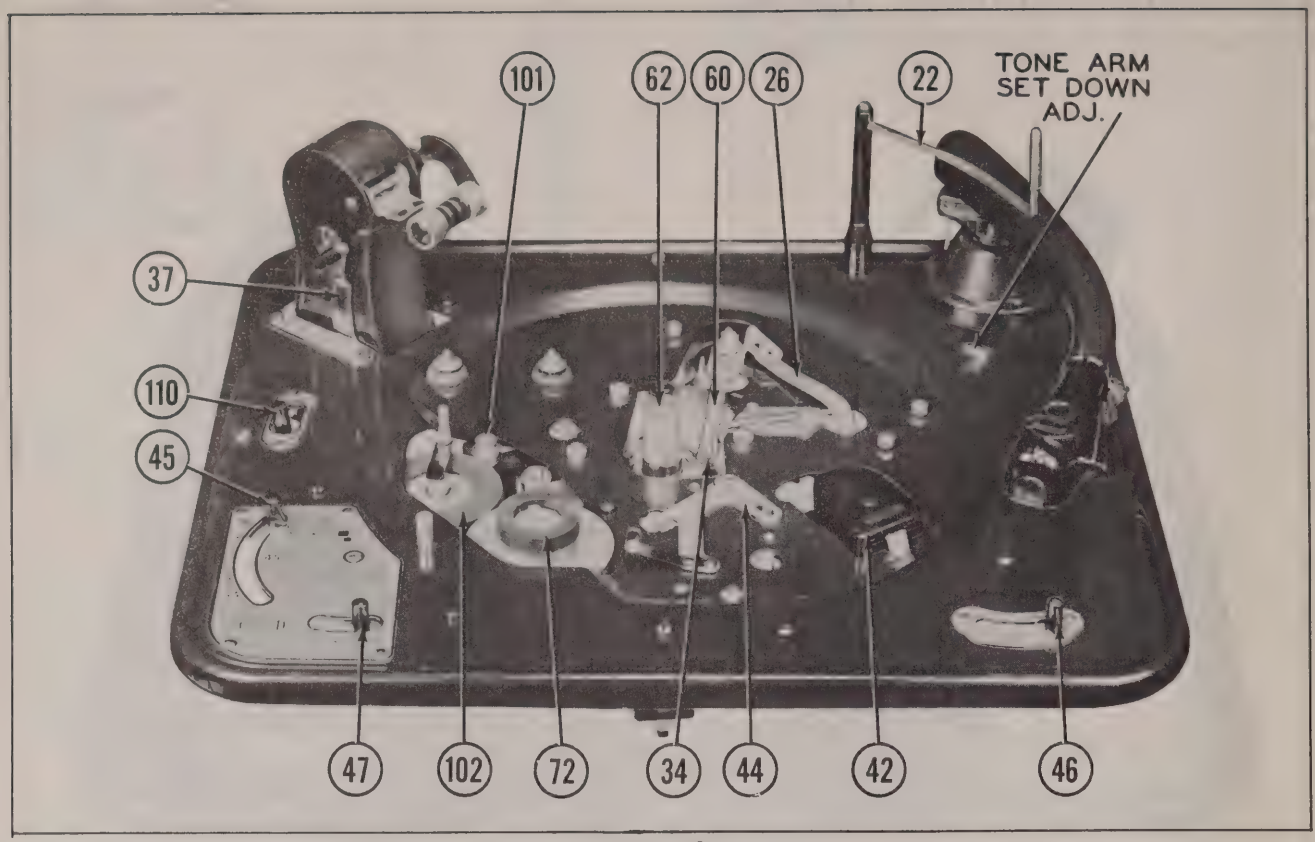

Figure 2

OPERATING INSTRUCTIONS

1. Insert the correct pickup head into position for type record to be played; i. e., one having a .002" to .003" radius needle for 78RPM records, or a .001" radius needle for 33 1/3 and 45RPM records.

2. Place the correct spindle in position, the stepped sloping spindle for 78 or 33 1/3RPM records, or the large spindle for 45RPM records.

3. Set lever at side of record platform (53) to position corresponding to size of record to be played.

4. Move speed control knob (45) to desired speed, 78, 45, or 33 1/3RPM.

5. Place any number of records up to ten, on the record spindle, lower record clip, and switch on by moving the front left hand knob to "Start".

NOTE: When playing 7" 45RPM records the record clip must be in the rear position.

To Reject A Record-

To reject a record at any time while changer is operating, move front left hand knob to "Reject" and release.

Stopping-

The changer can be switched off by moving the left hand knob to "Stop" position. If this is done while a record is playing, when switching on again, that record will be automatically rejected and the next record commenced.

Speed Regulation-

A variable speed control is fitted to this changer and to set the speed accurately proceed as follows:

Proceed as instructed under "Operating Instructions". Place one record on spindle and switch changer on. When pick-up lands on record, place stroboscope disc on record and move speed adjustment knob (110) until the ring of dots on the stroboscope, coinciding with the speed indicated by the speed control knob (45), appears to remain stationary when viewed by light from a lamp on the appropriate AC supply.

The speed will now be correct, the stroboscope should be removed and the changer operated as instructed. Once the speed has been set no further adjustment need by made.

Manual Operation-

The purpose of the manual control is to disconnect the changing, automatic trip, and reject mechanism so that single records can be played as on a single record player. To use this feature, move the Manual-Auto knob (46) to the "Manual" position, switch on changer to enable the mechanism to complete its cycle, the pickup can then be handled and the changer used as a single record player using the short spindle for 78 or 33 1/3RPM records. Place the 45 adaptor over the short spindle for playing large hole 45RPM records.

NOTE: Should the record changer be stopped in the "Auto" position with the pick-up arm not on

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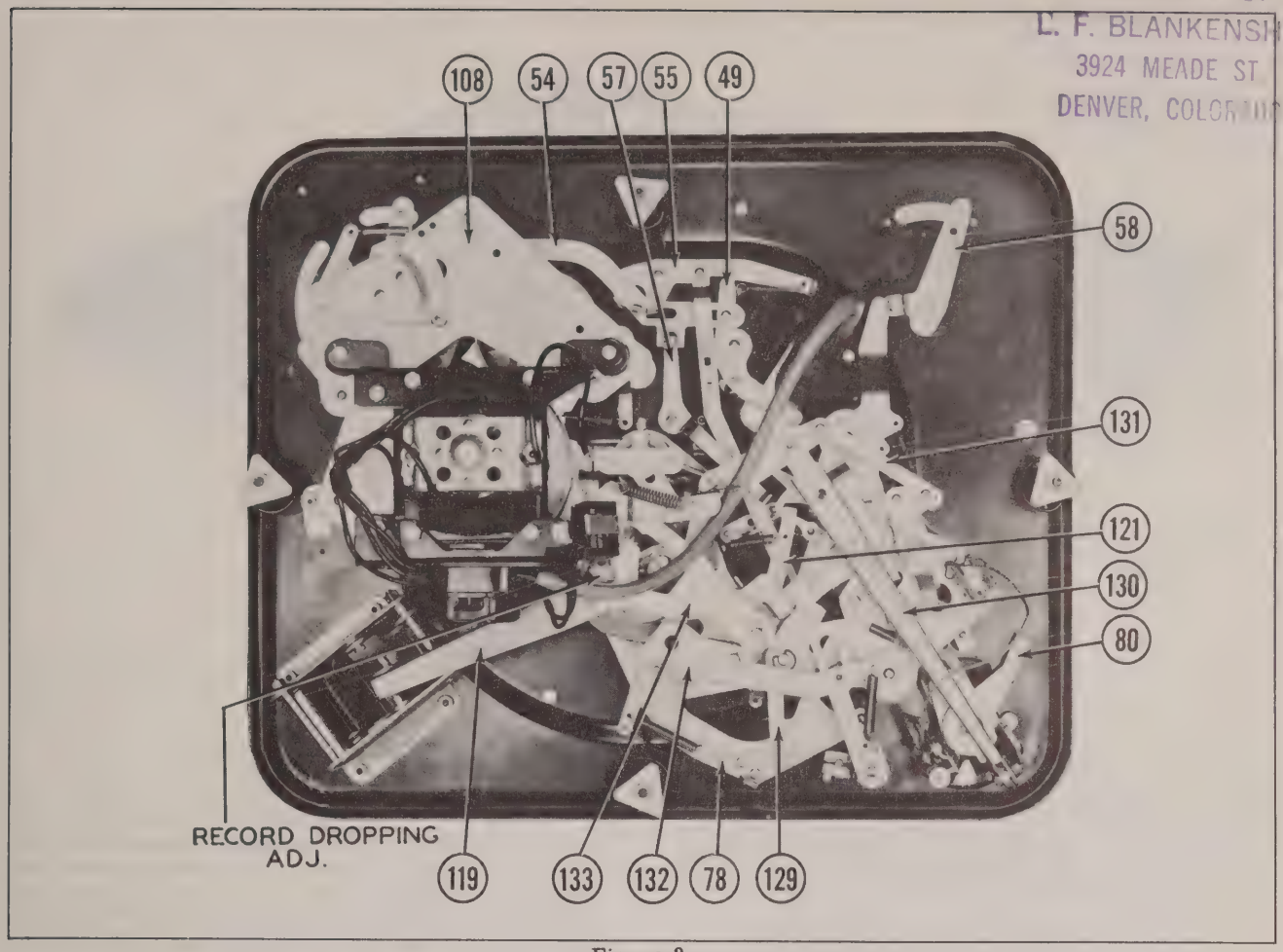

Figure 3

its rest, the pick-up should not be handled, but the left hand knob moved to "Start". The pick-up will now automatically lift and return to its rest position and the changer will stop if no records are on the spindle.

The pick-up arm will not move from its rest unless one or more records are placed on the spindle. This is a safety device designed to prevent the pick-up being damaged should the changer be switched on without being loaded with records.

CHANGE CYCLE

The change cycle is put into operation by moving the "Stop-Start-Reject" knob (47) to "Reject". As knob (47) is moved to "Reject" position several associated parts move simultaneously. Switch lever (49) latches with switch catch lever (55), closing switch (42). The motor is started and inter wheel (102) makes firm contact with motor pulley (101) and drive wheel (72), thru tension applied by inter wheel tension spring (63), thus starting the rotation of turntable (24). Reject lever (57) moves against trip lever (79), unlatching impulse lever (121) which, in turn, moves against the pin located on top of cycling cam (120). Tension applied to the impulse lever (121) by the impulse lever actuating spring (157) is sufficient to move cycling cam (120) far enough to unlatch gear mounting plate (109) from cycling gear (97). This permits gear mounting plate (109) to be pivoted forward, by action of gear plate actuating spring (158), moving cycle idler wheel (100) into firm contact with motor pulley (101). This action starts the rotation of cycling gear (97) and cycling cam (120), which are secured together and move in unison.

As the cycling gear (97) and cycling cam (120) revolve, the lifting lever (151) is pivoted, due to the cam roller on lever (151) following the contour of cycling cam (120). This, in turn, through its connected levers, closes the muting switch (86) and actuates the lifting crank (127) which raises the lifting plate and spindle (85), thus raising the tone arm.

At this time, cycling cam (120) pivots shut-off cam lever (132) which pulls discriminating lever (22) inward; however, with records on the spindle, the discriminating lever (22) is blocked from making its full inward travel, thereby preventing the shut-off operation.

At this position of cam rotation, cycling cam (120) pushes coupling link (119) back. This, in turn, actuates the record dropping mechanism, thus selecting the bottom record and dropping it to the turntable. At the same time, the 45RPM spindle actuating lever assembly (132) is pivoted by cycling cam (120). This actuates the 45RPM spindle when it is used.

Cycling cam (120) pivots the tone arm actuating lever (78), causing its roller to engage the pickup lever (81) which, in turn, moves the tone arm outward. Now, the stud on index lever assembly (81A) makes contact with the pickup lever (81) and moves the tone

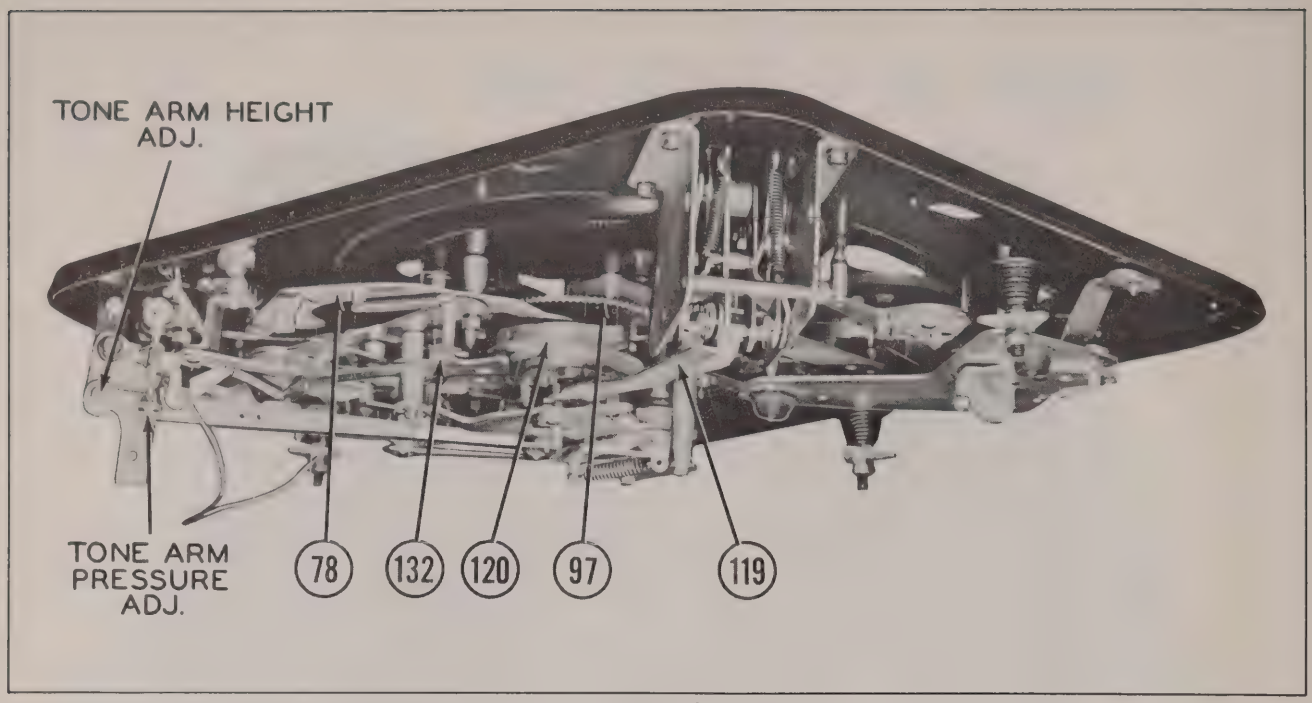

Figure 4

arm inward, by action of index lever spring (88), until the ear on index lever (81A) contacts one of the set-down steps on tone arm locator lever (129). The set-down step in which the ear of index lever (81A) engages is determined by the size record being played. This positions the tone arm for set down.

Lifting lever (151) now returns to its normal position; and, through the connected parts, the tone arm is lowered to the record and the muting switch is opened.

At this time, by action of cycling cam (120), impulse lever (121) is reset with trip lever (79). Simultaneously, the pin located on the bottom of cycling gear (97) moves against gear mounting plate (109) and moves it far enough to disengage cycle idler wheel (100) from motor pulley (101), thereby completing the change cycle.

As the needle follows the grooves of a record and moves the tone arm in toward the spindle, trip arm (80), which is secured to the tone arm shaft (29), engages and moves the velocity trip link (26). This, in turn, pivots friction plate (25) and automatic trip lever (60) toward main spindle (62). While a record is playing, the slight inward movement by automatic trip lever (60) is not sufficient to trip the mechanism, because, on each revolution of main spindle (62), the wiping contact by the spindle striker moves the automatic trip lever (60) back.

When the tone arm reaches the end of the music grooves, its movement is accelerated. This increases the movement of the automatic trip lever (60) which is caught by the striker on main spindle (62) and lifted on its cam face. This, via trip rod (34), moves trip lever (79) thus releasing impulse lever (121) which, in turn, gives cycling cam (120) a push and causes cycle idler wheel (100) to again engage with motor pulley (101) and drive the mechanism through its cycle.

AUTOMATIC SHUT-OFF

When the last record has been played, the change cycle starts again. Since there are no records on the spindle, the discriminating lever (22) is allowed to move in far enough for link (132A) to pivot tone arm locator lever (129) so that its hooked end will engage with the ear on tone arm actuating lever (78). This prevents the tone arm actuating lever (78) from following the contour of cycling cam (120), but holds it in a position so that the outermost cam surface on cycling cam (120) strikes the tone arm actuating lever (78) and in so doing causes it to contact and move trip link (59) which, in turn, releases switch lever (49), shutting off the changer.

ADJUSTMENTS

Tone Arm Height- (See Fig. 4)-

The tone arm should be adjusted so that it will clear a stack of ten records on the turntable. To adjust, loosen nut (144) and turn screw (142) until the eccentric pivot is in the desired position. After adjustment is made, re-tighten nut (144).

Tone Arm Set-Down Point- (See Fig. 2)-

If, for any reason, the tone arm lever assembly (81) has been removed, the tone arm set-down point may be readjusted as follows:

1. Place a 10" record on the spindle.

2. Move the platform lever to 10" position.

3. Start a change cycle; when the tone arm has moved in as far as it will go, shut-off the changer. Loosen tone arm lever clamp nut (156) and while holding tone arm lever (81) in position,

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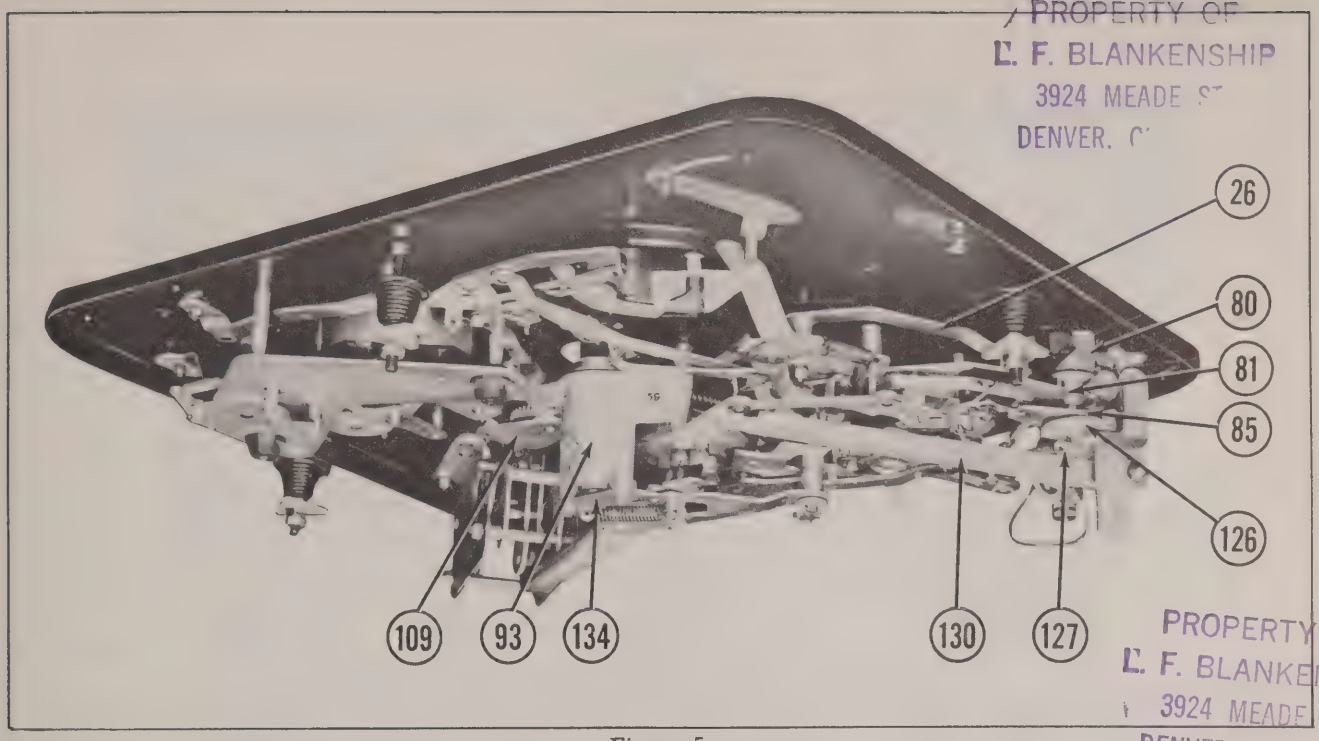

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Figure 5

move the tone arm in or out until the needle is positioned directly over the starting groove of the record. Tighten clamp nut (156) and check adjustment.

Should a minor adjustment be required, rotate the screw accessable through the hole in the baseplate as shown in Figure 2. This adjustment can be made only when the tone arm is in the rest position.

Needle Pressure- (See Fig. 4)-

The needle pressure adjusting screw is located under the baseplate at the rear of the tone arm. To adjust the needle pressure the knurled knob should be turned to give either an increase or decrease in spring tension. Alternatively, the screw head at the top of the knurled knob is accessable by inserting a screwdriver through the slot at rear of tone arm base.

Before attempting to adjust the needle pressure refer to the cartridge manufactures specifications for the recommended needle pressure.

Record Dropping- (See Fig. 3)-

If the changer fails to drop any records other than the 45RPM type having a large center hole, first make sure that the records are not badly warped. If they are reasonably flat, the record pushing pawl setting should be checked and adjustments made if necessary. To adjust the position of the record pushing pawl the star adjusting wheel located on coupling link (119) should be turned. This adjustment wheel is spring loaded and should be lifted by prying up with a screw driver to clear its locating pin and turned to an adjacent hole. Also check the record spindle to see that it is not bent out of position.

Should records fail to drop correctly when using the large diameter spindle, replace this spindle with the sloping one and see if it leans towards the record platform and is exactly in line with it. If this spindle is out of position it should be set correctly by loosening the two screws located on front of main spindle housing (93) and turning the record spindle until it leans toward the center of the record platform. After tightening the screws, see that main spindle (62) has a small amount of end play by first removing the turntable and gripping main spindle (62), lift it up and down. If no end play is felt, adjust as follows:

Loosen the two screws, located on front of the main spindle housing (93), which hold the fixed portion of main spindle (62). Raise the main spindle a very small amount and retighten the screws.

Velocity Trip Adjustment-

Should the trip commence to operate too early or too late (in the latter case it would fail to operate) check the radius at which it commences. Set the changer in the playing position, remove the turntable and, holding the tone arm in the hand, slowly move it towards the record spindle as if playing a record. When the needle point is nearly 2 7/8" from the record spindle the friction lever (25) should start to move carrying with it automatic trip lever (60). At 2 7/8" radius auto trip lever (60) should touch the striker on main spindle (62). A quick inward movement of the tone arm should then cause the trip to operate if the main spindle (62) is turned by hand.

If this dimension is not correct, loosen the two screws on trip arm (80) and move trip arm (80) in the required direction. If the screws are left partially tight, trip arm (80) can be tried for position as described above, re-adjusted and the screws finally tightened.

If the trip still fails to operate, it may be caused by the automatic trip lever (60) being too low and,

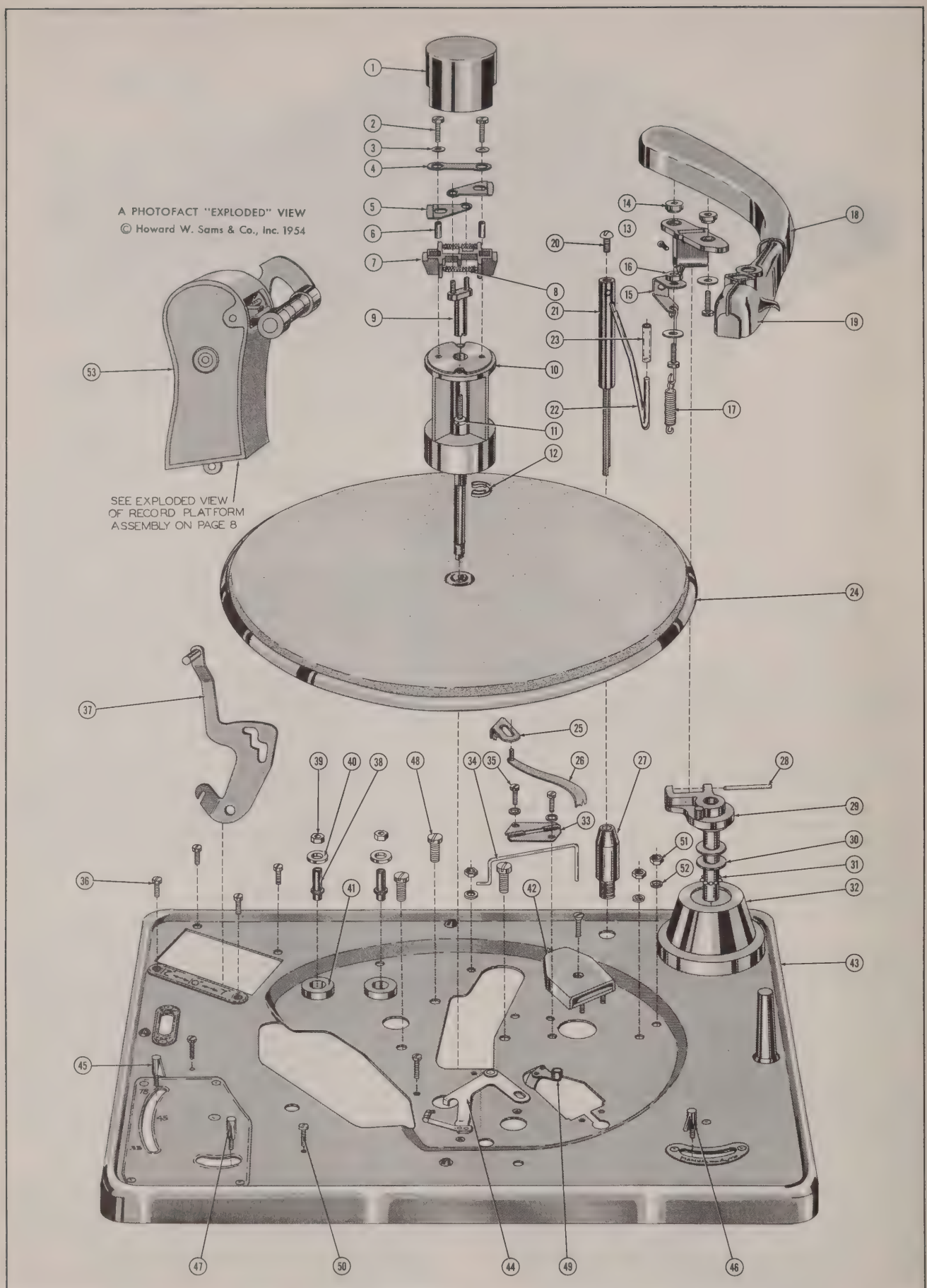

Figure 6A. Exploded View Of Parts Above Baseplate.

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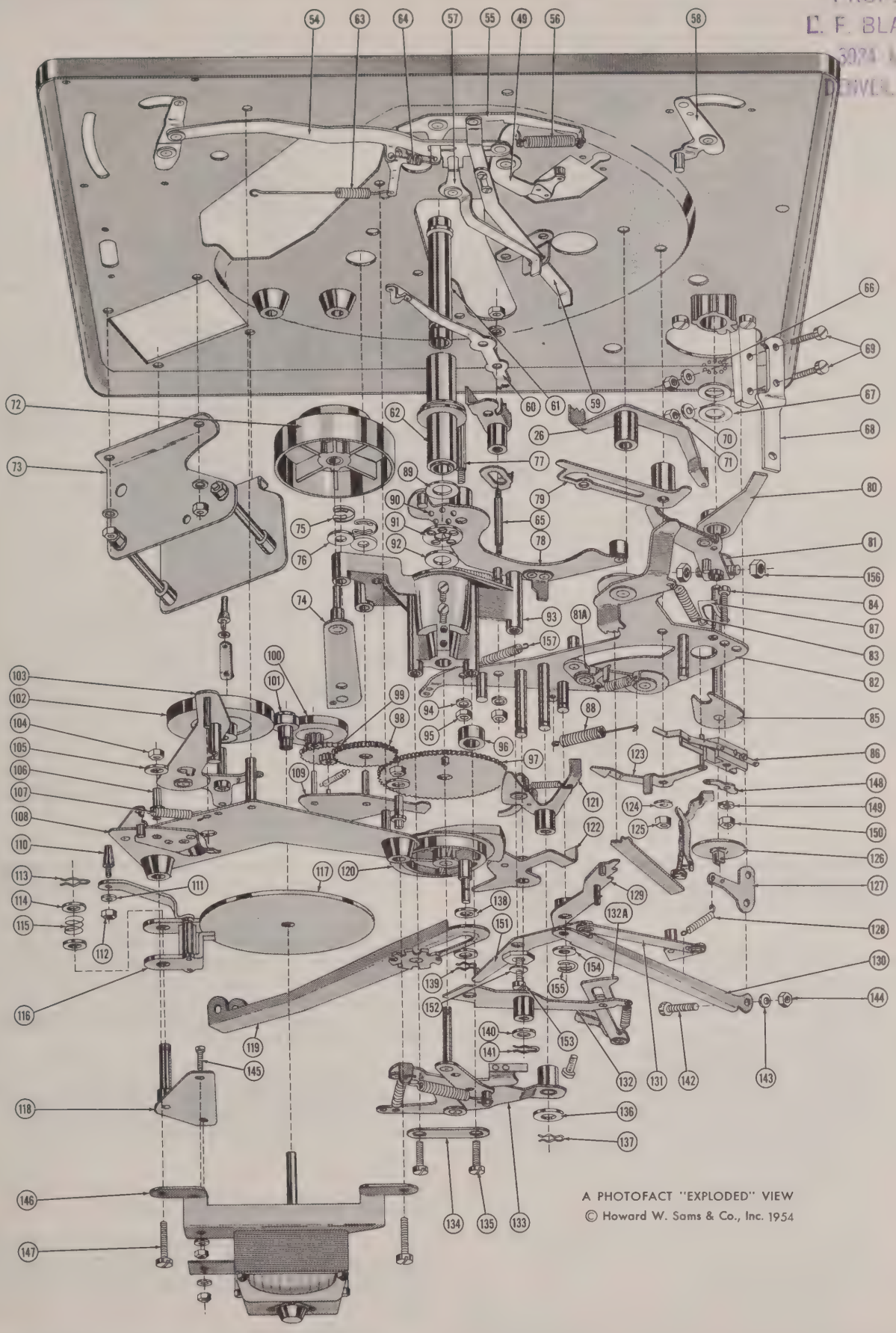

Figure 6B. Exploded View Of Parts Below Baseplate.

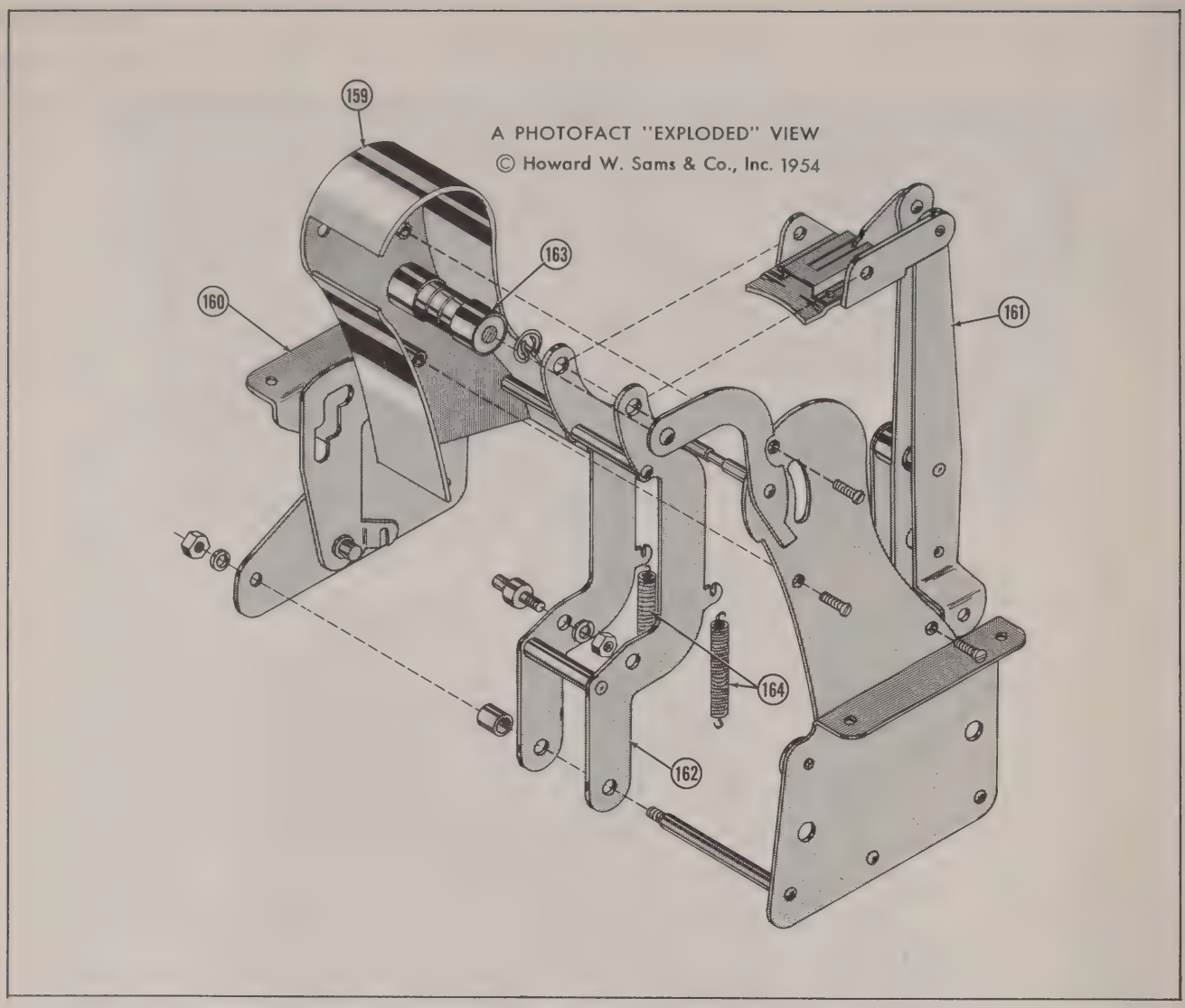

Figure 7. Exploded View Of Record Platform Assembly.

consequently, not riding up the incline of the striker. To adjust, turn the screw on automatic trip lever (60) about half a turn in a clockwise direction.

Cartridge Muting Switch-

A cartridge muting switch (86) is connected across the pick-up cartridge to short circuit the pick-up except when the changer is in the playing position. It is important to note that no sound will be obtained from the pick-up by flicking the needle when the pick-up is on its rest. The muting switch contacts should be closed except when the changer is in its playing position. Should this switch fail to operate, clean the contact faces, and insure that they make and break according to the position of the changer mechanism.

TROUBLES

Speed Variation-

1. It is essential that the driving surfaces of the brass motor pulley and the rubber tired idler wheels be kept absolutely free from all oil or grease. This is the first point which should be checked if the turntable speed varies. The pulleys and idlers should be cleaned with a dry cloth if contamination with oil is suspected.

2. If a thick oil has been used to lubricate the motor bearings, the motor will appear weak or will not start. It will then be necessary to dismantle the motor and clean away all traces of the thick oil. It is, therefore, essential to lubricate the motor bearings with a good quality thin oil.

3. Main spindle (62) has no end play and, therefore, will not permit the turntable to run freely. To adjust, refer to "Record Dropping" paragraph 3.

Changer Fails To Reject Or Trip-

1. Impulse lever actuating spring (157) loose or missing. If this spring is missing the impulse lever (121) will not move cycling cam (120) to start the change cycle.

2. Check velocity trip as described under "Velocity Trip Adjustment".

Needle Does Not Track Across Record Properly-

1. Needle may be clogged by accumulation of lint, dirt, etc.

2. Check condition of needle tip.

3. Check tone arm weight as described under "Needle Pressure".

4. Check tone arm pivot points for freedom of movement.

5. See that the changer is floating freely on its suspension springs, otherwise, the slightest vibration can cause the needle to skip across grooves.

6. Check the pick-up lead to see that it has enough slack to allow the needle to fully seat in the record grooves.

Turntable Does Not Revolve When Control Is Moved To "Start"-

1. No current at motor.
   (a) Check that current is reaching terminal block.

   (b) Check that switch (42) is operating properly.

   (c) Check wiring and terminal connections in changer.

2. Motor defective.
   (a) Remove turntable and allow motor to operate without load. If current is reaching motor and drive shaft does not rotate, the motor is defective. Repair or replace.

3. Inter wheel (102) not contacting motor shaft.
   (a) Check that spring (63) is not loose or missing.

Tone Arm Strikes Records On Spindle During Cycle-

1. Tone arm height not adjusted properly.
   (a) See instructions for adjusting tone arm height under "Adjustments".

Noise During Playing Of Record-

1. Motor rumble.
   (a) If a low-pitched rumbling sound comes from the loudspeaker while a record is being played, check motor grommets to be sure the motor is freely suspended on them. The motor leads should have slack to allow the motor to float. Motor rumble may also come from an unbalanced motor rotor; in this case, replace the motor.

2. Defective turntable bearings (90).
   (a) Defective turntable bearings can cause rumble. Check for foreign matter in the bearing, defective balls, binding between balls and ball retainer; rough surface on washers. Clean bearing assembly and lubricate with light mineral oil.

3. Defective drive wheel tire.
   (a) A rapid thumping sound while the motor is running may indicate a flat spot on one of the drive wheel tires. If this condition does not clear up after a few minutes of running time, remove the turntable and inspect all rubber tires. If the tire surface is not even and smooth, replace the part. Should the bearing of the part show signs of excessive wear or be extremely wobbly, the defective drive wheel should be replaced.

4. Defective record.
   (a) Worn or defective records cause needle scratch and distortion of the recorded sound. If a record is warped, it may slip on the other records causing "Wow" (a waver in the recorded sound). A chipped or enlarged center hole in a record can also cause "Wow".

5. Defective needle.
   (a) A defective needle will cause an excessive scratchy sound and will greatly reduce record life. Do not permit the use of a needle to its complete limit of wear. Best results are obtained by installing a new stylus periodically before defective reproduction becomes apparent.

LUBRICATION

The motor and drive wheel bearings are of the oilite type and rarely need lubricating. When the need for oil is apparent use a good grade of light machine oil.

CAUTION: Apply only one or two drops of oil on each bearing surface. Carefully remove every trace of surplus oil before operating the changer.

Occasionally, especially if the changer mechanism becomes rather noisy, put a smear of grease such as Lubriplate on all cam faces, and lightly lubricate all lever pivots.

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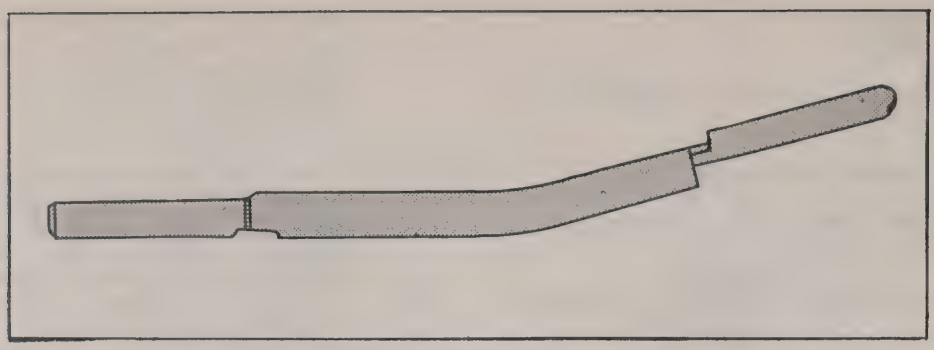

Figure 8. Template for Record Spindle. If records fail to drop or more than one record drops at a time, check record spindle by laying it on above template to see that it is not bent out of position.

PARTS LIST

Ref. No.	Description	Ref. No.	Description
1	Spindle Cap	50	Screw
2	Pawl Unit Mounting Screw	51	Nut
3	Spring Washer, Two Used	52	Washer
4	Retaining Plate	53	Record Platform Assembly
5	Separator	54	Switch Link
6	Pawl Bushing	55	Catch Lever With Trip Link Extension
7	Pawl, With Spring Pins	56	Spring For Catch Lever
8	Spring, Two Used	57	Reject Lever
9	Crank, With Pins	58	Manual & Automatic Selector Lever
10	Support, With Spindles & Operating Collars	59	Trip Link
11	Spindle Cap Mounting Screw	60	Automatic Trip Lever
12	Spring Clip	61	Fixed Spindle
13	Pickup Arm Mounting Bracket	62	Main Spindle
14	Shoulder Washers, Two Used	63	Spring, Inter Wheel Tension
15	Anchor Plate	64	Spring
16	Spacer Washer	65	Spindle
17	Counterbalance Spring	66	Ball Bearings
18	Pickup Arm	67	Thrust Washers
19	Pickup Head Complete	68	Support
20	Screw	69	Screw
21	Bushing, Discriminating Lever	70	Washer
22	Discriminating Lever	71	Nut
23	Plastic Sleeve, Discriminating Lever	72	Drive Wheel And Tire
24	Turntable, Complete	73	Mounting Bracket, Record Platform Assy.
25	Friction Lever	74	Support Plate
26	Velocity Trip Link	75	"C" Clip
27	Discriminating Lever Mounting Base	76	Washer
28	Pivot Pin, Pickup Arm Mounting Bracket	77	Spindle
29	Pickup Arm Shaft, Includes Pivot Bracket	78	Tone Arm Actuating Lever
30	Thrust Washers	79	Trip Lever With Bushing
31	Ball Bearings	80	Trip Arm
32	Pickup Arm Mounting Base	81	Tone Arm Lever Assembly
33	Mounting Plate For Trip Rod	81A	Index Lever Assembly
34	Trip Rod	82	Bridge With Pivot Pins
35	Trip Rod Mounting Plate Screw	83	Spring
36	Mounting Screw, Record Platform Assembly	84	Screw
37	Change-Over Lever, Record Size	85	Lifting Spindle With Lifting Plate
38	Spacing Collar	86	Muting Switch
39	Spacing Collar Nut	87	Lifting Spring
40	Spacing Collar Washer	88	Spring, Index Lever
41	Rubber Bushing	89	Washer
42	Switch Assembly	90	Ball Bearings
43	Baseplate Assembly	91	Ball Bearing Holding Washer
44	Spring Tension Lever, With Felt Pad	92	Washer
45	Knob, Speed Control	93	Main Spindle Housing
46	Knob, Manual-Auto.	94	Washer
47	Knob, Off-On, Reject	95	Nut
48	Screw	96	Spacer
49	Switch Lever With Roller	97	Cycling Gear

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Ref. No.	Description
98	Cycle Drive Gear
99	Gear, Double
100	Cycle Idler Wheel & Gear
101	Pulley, Motor
102	Wheel, Inter, With Rubber Tire
103	Inter Wheel Mounting Bracket
104	Nut
105	Washer
106	Spacing Collar
107	Spring
108	Motor Mounting Plate, Complete
109	Mounting Plate For Cycling Gears
110	Knob, Magnetic Speed Adjust
111	Washer
112	Nut
113	Retaining Clip
114	Washer
115	Spring
116	Magnetic Speed Adjust Assembly
117	Magnetic Speed Adjust Wheel
118	Magnetic Speed Adjust Spindle & Plate
119	Coupling Link
120	Cycling Cam
121	Impulse Lever
122	Locator Stop Lever
123	Shut Off Lever
124	Washer
125	Nut
126	Lifting Disc.
127	Lifting Crank
128	Lifting Crank Spring
129	Tone Arm Locator Lever
130	Lifting Link
131	Lifting Lever With Lifting Link, Connecting
	Link & Muting Switch Lever
132	Shut-Off Cam Lever
133	45RPM Spindle Actuating Lever Assembly
134	Center Plate
135	Center Plate Mounting Screw
136	Washer
137	Retaining Clip
138	Washer
139	Retaining Clip
140	Washer
141	Retaining Clip
142	Screw, Height Adjustment
143	Washer, Flat Steel
144	Nut, Hex
145	Screw, Magnetic Speed Adjust Plate
146	Motor With Mounting Bracket
147	Screw, Mounting Bracket
148	Switch Ground Lug
149	Lockwasher, Split
150	Nut
151	Lifting Lever
152	Washer
153	Screw
154	Washer
155	"C" Retaining Clip
156	Nut, Hex
157	Spring, Impulse Lever Actuating
158	Spring, Gear Plate Actuating
159	Record Platform Cover
160	Mounting Bracket & Change-Over Lever
161	Push-Off Lever Assembly
162	Positioning Lever Assembly
163	Record Hold-Down Arm
164	Spring, Positioning Lever

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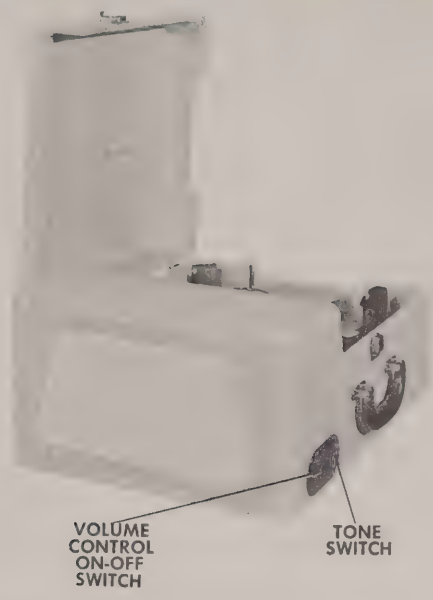
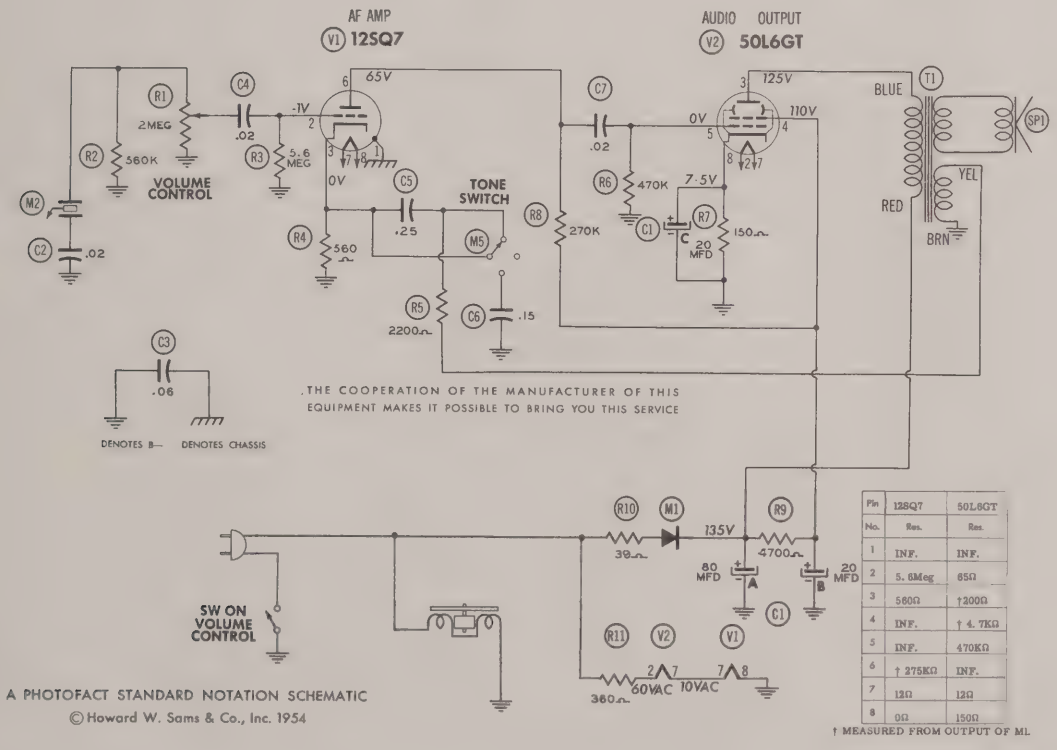
PHONOLA
MODEL TK2149



TRADE NAME	Phonola Model TK2149
MANUFACTURER	Waters-Conley., Rochester, Minn.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Two)	Types 12SQ7 AF Amp., 50L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 11352-SEE SIMILAR V-M Model 950 - PHOTOFACT SET # 216-FOLDER # 11 OR RECORD CHANGER MANUAL CM-5.



Pin No.	12SQ7 Res.	50L6GT Res.
1	INF.	INF.
2	5.6Meg	65Ω
3	560Ω	†200Ω
4	INF.	† 4.7KΩ
5	INF.	470KΩ
6	† 275KΩ	INF.
7	12Ω	12Ω
8	0Ω	150Ω

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHONOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	12SQ7	12SQ7	8Q	
V2	Audio Output	50L6GT	50L6GT	7S	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2 Meg	½	10496	Q13-139	A47-2Meg-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	NOTES
R2	560KΩ	½	8842	BTS-560K	
R3	5.6Meg	½	10301	BTS-5.6Meg	
R4	560Ω 5%	½	10921	BTS-560 5%	
R5	2200Ω	½	10986	BTS-2200	
R6	470KΩ	½	10305	BTS-470K	
R7	150Ω	½	9897	BTS-150	
R8	270KΩ	½	8841	BTS-270K	
R9	4700Ω	½	10429	BTS-4700	
R10	39Ω	½	10428	BTS-39	
R11	360Ω 5%	10	10584		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC. 1	REPLACEMENT DATA: PHONOLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.3KΩ	2.9Ω SEC. 2 1.1Ω Res.	10859						

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: PHONOLA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	2.9Ω	10987	ST-108 Mod. P6-X	6A1	

SELENIUM RECTIFIER

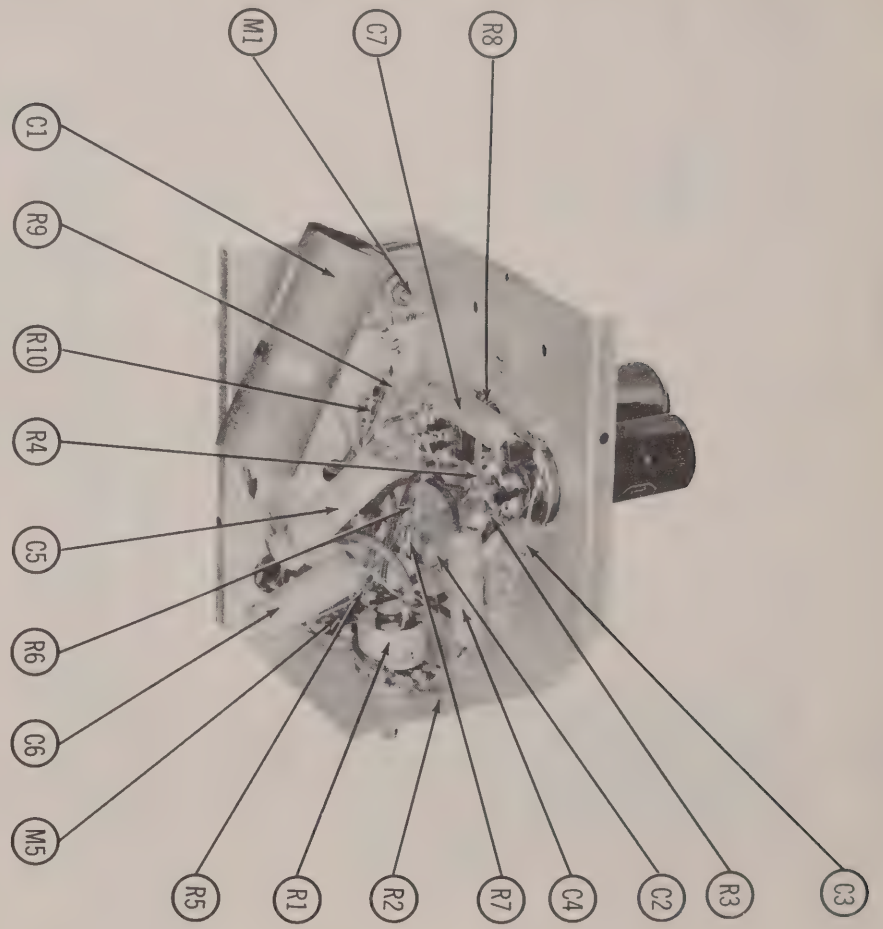
ITEM No.	RATING: CURRENT	REPLACEMENT DATA: PHONOLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.057A	10432	1263A	RS65	6S65	65	5M4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: PHONOLA PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M2	11406					43	0-2 or S-2	

ELECTORO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: PHONOLA PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M3	11407	† S-66	† AC-434 ♦† AC-434D1 †♦ AC-434D2 ♦ AC-434D	† W-75TPS	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHONOLA PART No.	NOTES
M4	Changer	11352	V. M.
M5	Switch	10879	Tone Selector

PHOTOFACT* Folder

RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 21-S-348KU

RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

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DATE 11–54 SET 258 FOLDER 10

PHOTOFACT* Folder

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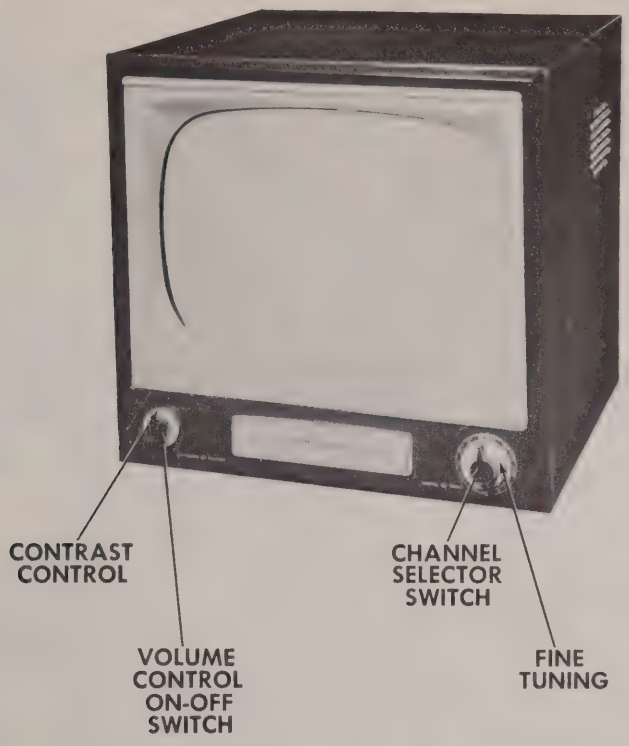

RCA VICTOR MODEL 21-S-348KU

TRADE NAME	RCA Victor	MODELS	CHASSIS	TUNER
		21-S-348K	KCS88A	KRK22D
		21-S-355K, 21-S-357K, 21-S-362K, 21-S-367K, 21-S-369K	KCS88	KRK22D
		21-S-348KU	KCS88H	KRK31
		21-S-355KU, 21-S-357KU, 21-S-362KU, 21-S-367KU, 21-S-369KU	KCS88F	KRK31

MANUFACTURER RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET Television Receiver
TUBES Twenty
POWER SUPPLY 110-120 Volts AC-60 Cycles RATING 1.54 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

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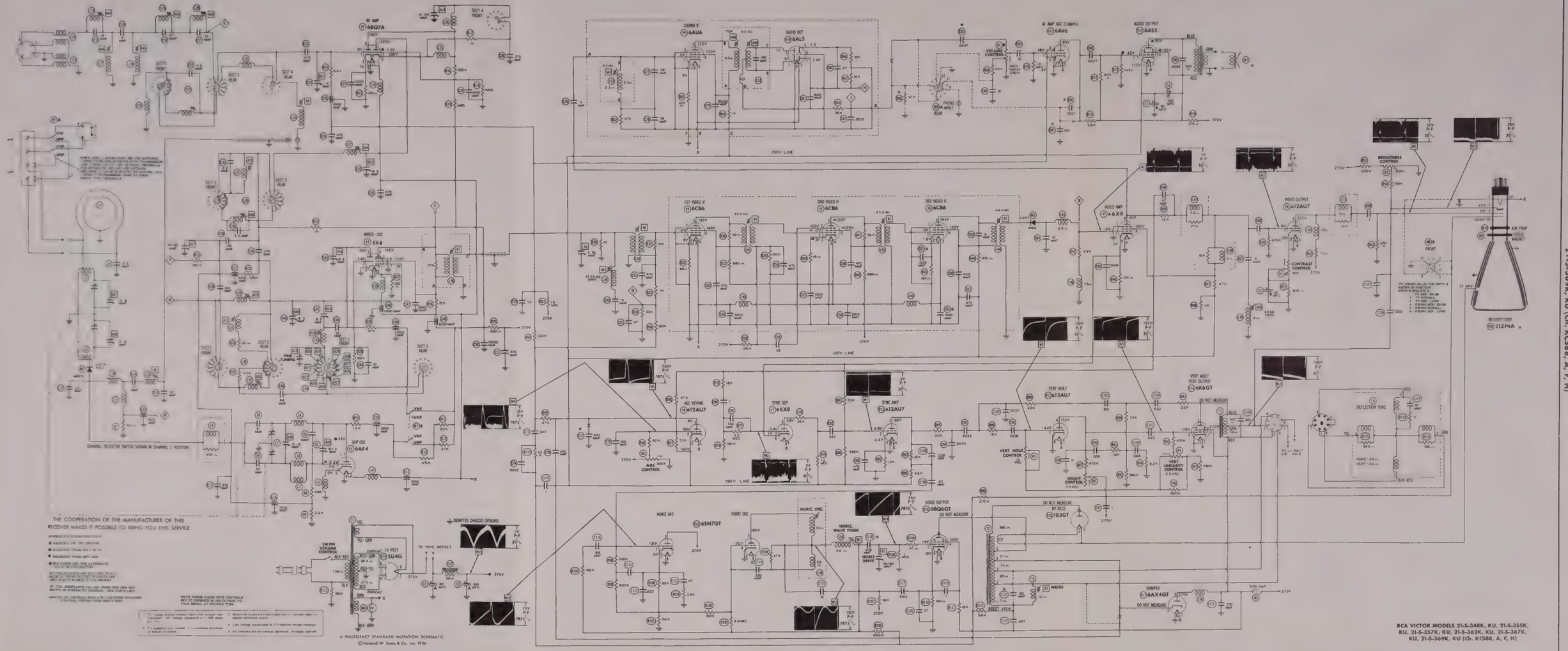

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RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

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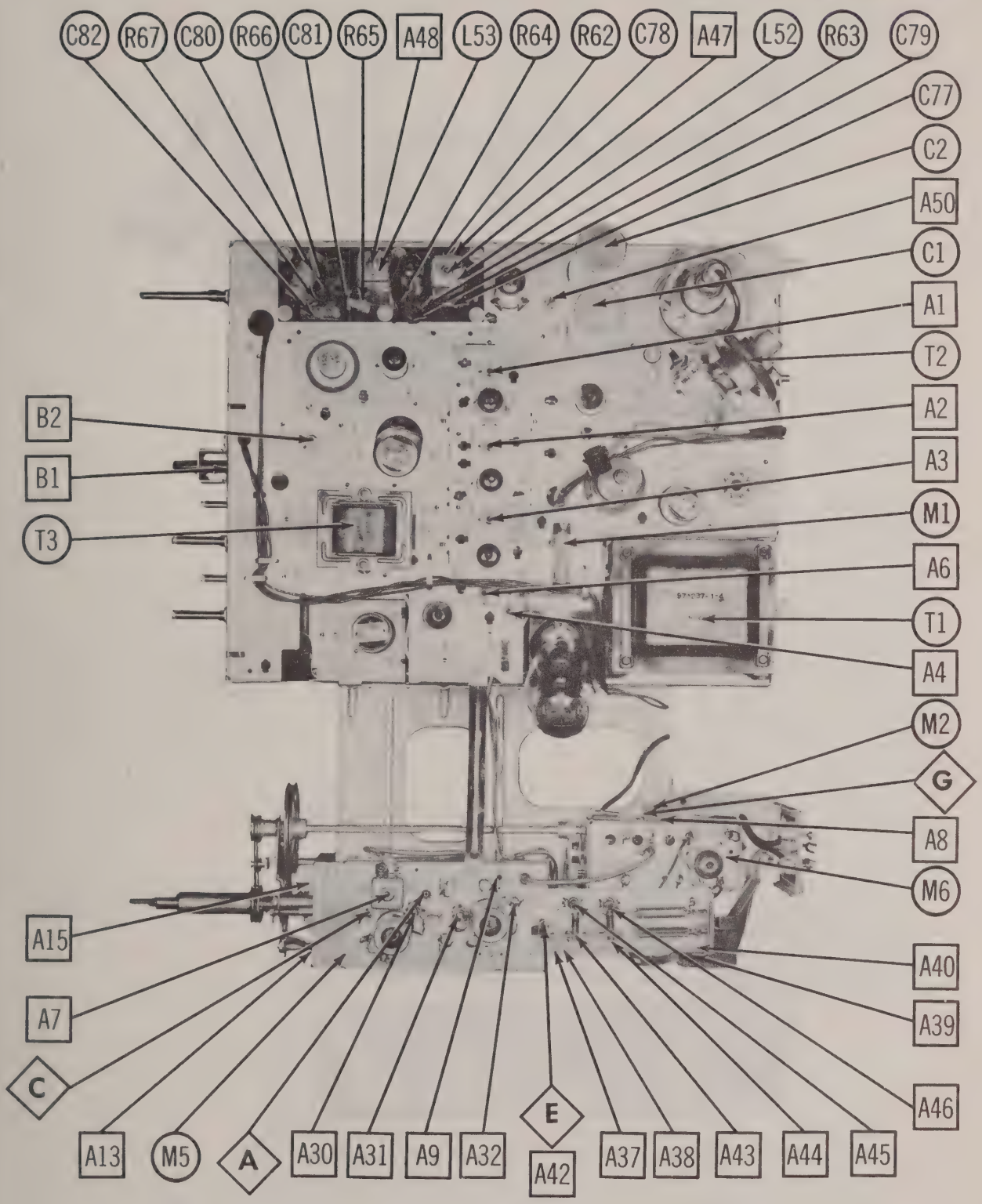
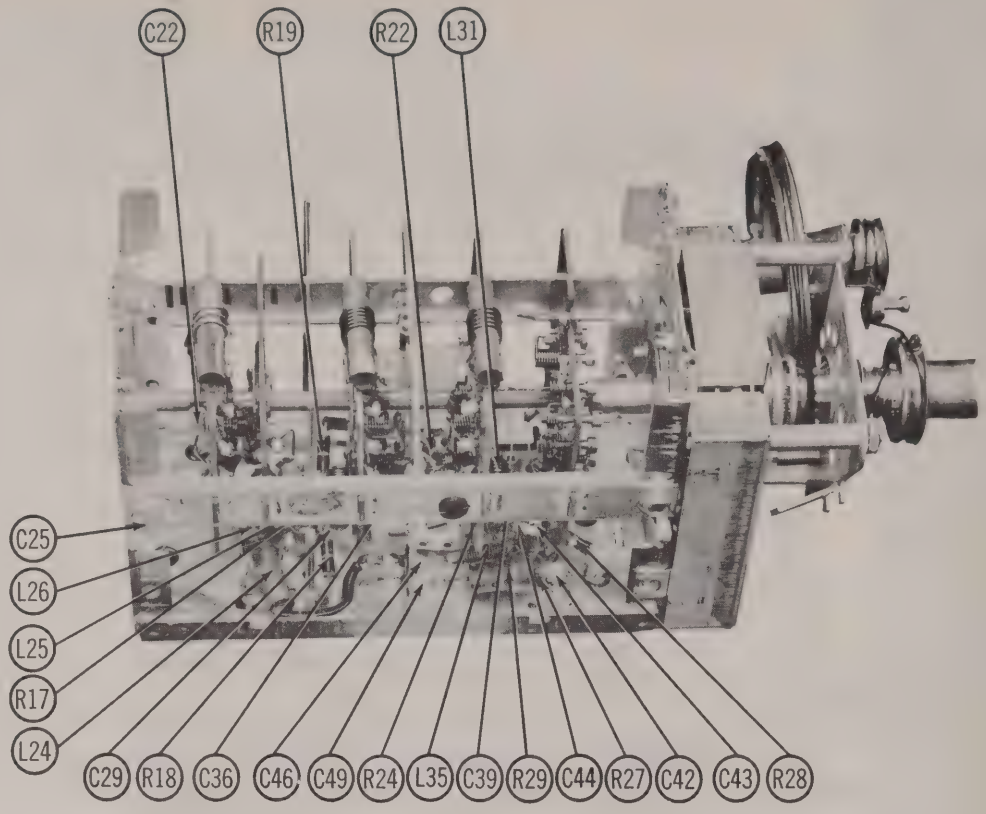
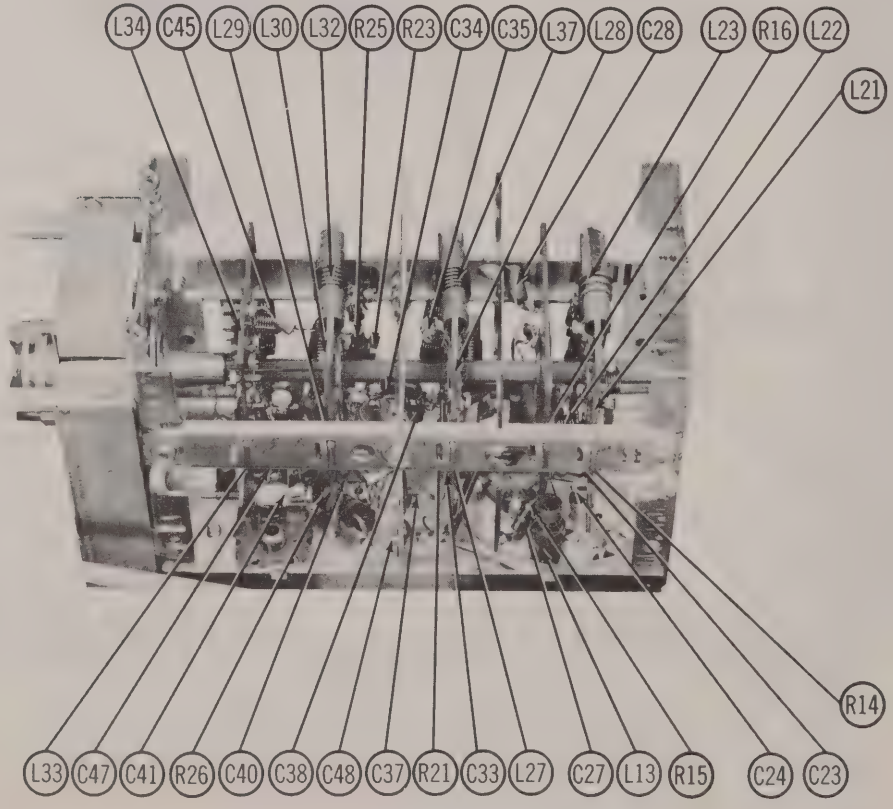


CHASSIS TOP VIEW



VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V15) to disable the high voltage.

VIDEO IF ALIGNMENT FOR MODELS 21-S-348KU THRU 21-S-369KU

Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery capable of withstanding considerable current drain. Connect the positive terminal to chassis and connect the potentiometer arm to the ungrounded side of C52. Connect the DC probe of a VTVM to the ungrounded side of C52. Common to chassis. Adjust the potentiometer arm for -4 volts on VTVM. Remove VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500MMF Ceramic Capacitor	High side thru 1500MMF to point Ⓐ. Low side to tuner chassis. Use very short leads.	Not used	44.5MC (Unmod)	Any unused channel	Use VTVM. DC probe thru 1Meg to point Ⓑ. Common to chassis.	A1	Attenuate generator output to maintain 3 volts at VTVM. If two peaks occur, use the one with the core at the end of coil nearest the chassis. Adjust for maximum deflection.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4	Use sufficient generator output to produce 3 volts at VTVM. Adjust for MINIMUM deflection. Correct setting of A4 is indicated when core end is at end of chassis.
5.	"	"	44MC (10MC Swp)	42.5MC 45.75MC	4	Vert. Amp. thru detector (Fig.1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A5, A6, A7	Connect 330Ω carbon resistor from pin 1 (grid) of 6CB6 (V6) to chassis. Connect 180Ω carbon resistor from pin 5 (plate) to pin 6 (screen) of 6CB6 (V4). Preset A5 to MINIMUM capacity. Couple a second signal generator loosely to detector probe (Fig.1) to furnish markers. Attenuate sweep generator output to maintain 0.3 to 0.5 volts peak to peak on scope for final adjustments. Adjust A6 and A7 for maximum gain with 45.75MC marker at 75% as in Fig. 2. Adjust A5 to place 42.5MC marker at 70% on response curve as shown in Fig.2. Remove the detector probe, the 330Ω and the 180Ω resistors.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Adjust sweep generator output for 3 to 5 volts peak to peak on scope. Couple marker generator loosely to grid of first video IF amplifier. Retouch A1, A2 and A3 to obtain response similar to Fig. 3. With sweep generator output increased 10 times. Check attenuation at 41.25MC. If necessary, retouch A1 and A3 so that response at 41.25MC is less than 5%.
7.	1000Ω Carbon Resistor in series with 1500 MMF Ceramic Capacitor	High side thru dummy to rear terminal of 1N82 crystal holder. Low side to tuner chassis. Use very short leads.	44MC (10MC Swp)	42.5MC 45.75MC	47 (670MC)	Vert. Amp. thru detector (Fig.1) to junction of 180Ω resistor and 1500MMF capacitor at point Ⓒ (See remarks)	A8, A9, A10, A11	Set the UHF changeover switch to UHF position. Connect a 1500MMF capacitor in series with a 180Ω carbon resistor from point Ⓒ to chassis with the capacitor end connected to point Ⓒ. Loosely couple second signal generator to detector probe (Fig.1) to provide markers. Connect the potentiometer arm of a second bias supply to the tuner AGC terminal. Connect positive side to chassis. Adjust for -3 volts at tuner AGC terminal. Adjust sweep generator output to produce not more than 0.5 volt peak to peak on scope. Adjust A8 and A9 for maximum response similar to Fig. 4. If necessary, adjust A10 to place 45.75MC marker at peak of response curve. Adjust A11 for MINIMUM tilt. Remove resistor, capacitor and detector probe from point Ⓒ.
8.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	42.5MC 45.0MC 45.75MC	13	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Attenuate sweep generator output to maintain 3 volts peak to peak on scope. Couple marker generator loosely to grid of first video IF amplifier. Leave the AGC bias at -3 volts and IF bias at -4 volts. Check all VHF channels for response similar to Fig. 3. If necessary, SLIGHTLY retouch A1 and A2 to correct any overall tilt that is essentially the same on all VHF channels.
			207MC (10MC Swp)	"	12			
			201MC (10MC Swp)	"	11			
			195MC (10MC Swp)	"	10			
			189MC (10MC Swp)	"	9			
			183MC (10MC Swp)	"	8			
			177MC (10MC Swp)	"	7			
			85MC (10MC Swp)	"	6			
			79MC (10MC Swp)	"	5			
			69MC (10MC Swp)	"	4			
			63MC (10MC Swp)	"	3			
			57MC (10MC Swp)	"	2			
9.	Remove VHF sweep generator and connect UHF sweep generator to antenna terminals (130Ω resistor in each lead). Check all UHF channels for response similar to Fig. 3. If necessary, SLIGHTLY retouch A8 and A9 to correct any overall tilt. Disconnect generators and bias supplies.							

RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

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ALIGNMENT INSTRUCTIONS (cont)

VIDEO IF ALIGNMENT FOR MODELS 21-S-348K THRU 21-S-369K

Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery capable of withstanding considerable current drain. Connect the positive terminal to chassis and connect the potentiometer arm to point Ⓓ. Connect the DC Probe of a VTVM to point Ⓓ. Common to chassis. Adjust the potentiometer arm for -4 volts on VTVM. Remove VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500MMF Ceramic Capacitor	High side thru 1500MMF to point Ⓐ. Low side to tuner chassis. Use very short leads.	Not used	44.5MC (Unmod)	Any unused channel	Use VTVM. DC probe thru 1MEg to point Ⓓ. Common to chassis.	A1	Attenuate generator output to maintain 3 volts at VTVM. Adjust for maximum deflection.
2.	"	"		45.5MC	"	"	A2	"
3.	"	"		43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4	Use sufficient generator output to produce 3 volts at VTVM. Adjust for MINIMUM deflection. Correct setting of A4 is indicated when core is at end of coil nearest chassis.
5.	"	"	44MC (10MC Swp)	42.5MC 45.75MC	4	Vert. Amp. thru detector (Fig. I) to pin 5 (plate) of first video IF amp. Low side to chassis.	A5, A6, A12	Connect a 330Ω carbon resistor from pin 1 (grid) of third video IF amplifier to chassis. Connect 180Ω carbon resistor from plate to screen of the first video IF amplifier. Preset A5 to MINIMUM capacity. Couple a second signal generator loosely to detector probe (Fig. I) to furnish markers. Attenuate sweep generator output to maintain 0.3 to 0.5 volt peak to peak on scope for final adjustments. Adjust A6 and A12 for maximum gain with 45.75MC marker at 70% as in Fig. 2. Adjust A5 to place 42.5MC marker at 70% on response curve as shown in Fig. 2. Remove the detector probe, the 330Ω and 180Ω resistors.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Adjust sweep generator output for 3 to 5 volts peak to peak on scope. Couple marker generator loosely to grid of first video IF amplifier. Retouch A1, A2 and A3 to obtain response similar to Fig. 3. With sweep generator output increased 10 times check attenuation at 41.25MC. If necessary, retouch A1 and A3 so that response at 41.25MC is less than 5%.
7.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	42.5MC 45.0MC 45.75MC	13	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.		Connect the potentiometer arm of a second bias supply to pin 5 or 6 (diode plate) of first audio amplifier (6AV6). Connect positive side to chassis. Adjust potentiometer arm for -3 volts at diode plates. Couple marker generator loosely to grid of first video IF amplifier. Leave the IF bias at 4 volts. Adjust sweep generator output for 3 to 5 volts peak to peak on scope. Check all channels for response similar to Fig. 3. If necessary, SLIGHTLY retouch A1 and A3 to correct any overall tilt that is essentially the same on all channels. Continue alignment with step 10.
			207MC (10MC Swp)	"	12			
			201MC (10MC Swp)	"	11			
			195MC (10MC Swp)	"	10			
			189MC (10MC Swp)	"	9			
			183MC (10MC Swp)	"	8			
			177MC (10MC Swp)	"	7			
			85MC (10MC Swp)	"	6			
			79MC (10MC Swp)	"	5			
			59MC (10MC Swp)	"	4			
			63MC (10MC Swp)	"	3			
			57MC (10MC Swp)	"	2			

KRK31 VHF TUNER ALIGNMENT FOR MODELS 21-S-348KU THRU 21-S-369KU

A tuner unit which is operative and requires only minor touch up adjustments will require no presetting of adjustments. Where complete alignment is necessary make the following adjustments:
Preset A13 all the way out.
Set channel 7 to 13 oscillator slugs one turn from tight.
Adjust A7 so that the slug is all the way out.
Do not alter any of the antenna matching unit adjustments.
Disconnect the link from terminals A' and B of L39 (first video IF trans) and terminate the link with a 39Ω carbon resistor.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to point Ⓒ. Low side to chassis.	Not used	43.5MC (400^Mod)	2	Vert. Amp. to point Ⓐ. Low side to chassis.	A14	Short the tuner AGC terminal to ground. Adjust scope for maximum gain and signal generator for maximum output. Adjust A14 for MINIMUM 400^ indication on scope. Remove short from AGC terminal.
11.		RF input of heterodyne frequency meter to end of insulated wire inserted in hole provided for adjustment of A17.		Set Freq. meter to 227MC	8	Not used	A15 A16 A13	Connect the potentiometer arm of one of the bias supplies to the tuner AGC terminal. Connect the positive lead to tuner chassis. Adjust for -3 volts at tuner AGC terminal. Preset A15 and -3 volts on VTVM at point Ⓒ. (Limits of oscillator injection voltage are 2-5.5 volts). Turn fine tuning control maximum clockwise. Adjust A16 for audible beat on frequency meter. Adjust A13 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mid-range position.

NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A16 switch to channel 13 and adjust A18 for channel 13 oscillator frequency, then switch to channel 12 and adjust A19 for channel 12 oscillator frequency. Continue down to channel 8 adjusting proper oscillator trimmer to obtain proper oscillator frequency on each channel. Also, on channel 8, adjust A16 for channel 8 oscillator frequency. Switch to channel 13 and adjust A18, then switch back to channel 8 and adjust A16 again.

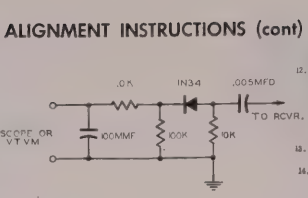

FIG. 1

FIG. 2

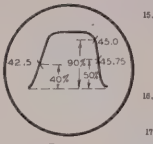

FIG. 3

FIG. 4

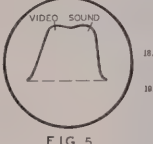

FIG. 5

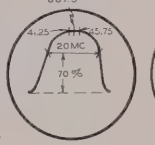

FIG. 6

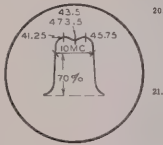

FIG. 7

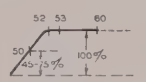

FIG. 8

FIG. 9

FIG. 10

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓐ. Low side to chassis.	A30, A17 A31, A32	Set A7 to maximum counter clockwise rotation. If separate marker generator is used couple it loosely to antenna terminals. Adjust scope for maximum gain and attenuate sweep generator output for a minimum signal input that will produce usable pattern on scope. Adjust A30, A17, A31 and A32 for response similar to Fig. 5.
13.	Connect the DC probe of VTVM to point Ⓓ. Common to chassis. Adjust A15 for -3 volts at point Ⓓ. Readjust A13, A17, A30, A31 and A32 for response similar to Fig. 5. Adjust A32 for maximum gain at mid-point of response curve. If necessary, repeat until desired response is obtained.							
14.		Connect frequency meter as in step 11.	Not used	Freq. meter to 257MC	13	Not used	A18 A13	Turn the fine tuning control maximum clockwise. Adjust A18 for audible beat on frequency meter. SLIGHTLY overshoot the adjustment an additional turn in the same direction and then adjust A13 to again obtain audible beat.
15.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point Ⓐ. Low side to chassis.	A33, A34	Adjust for response similar to Fig. 5. Turn off the generator and check oscillator injection voltage at point Ⓒ. Voltage should be within limits (2-5.5 volts). If A15 required readjustment turn sweep generator back on and recheck channel 13 response. If necessary, retouch A33 and A34 to obtain desired response.
16.		Connect frequency meter as in step 11.	Not used	Freq. meter to 227MC	8	Not used	A13	Check for audible beat on freq. meter. If necessary, readjust A13 for proper oscillator frequency.
17.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓐ. Low side to chassis.	A30, A17, A31, A32	If necessary, retouch A30, A17, A31 and A32 to obtain response similar to Fig. 5. Turn off the generators and switch back to channel 13 and check the oscillator injection voltage at point Ⓒ with VTVM. If the oscillator injection trimmer, A15, was far off it may be necessary to repeat steps 15, 16 and 17 several times before proper setting of A15 is obtained.
18.		Connect frequency meter as in step 11.	Not used	Freq. meter to 129MC	6	Not used	A35	Set fine tuning control to its mid-range position. Adjust A35 for audible beat on freq. meter.
19.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point Ⓐ. Low side to chassis.	A35, A36	Adjust for response similar to Fig. 5. Check oscillator injection voltage at point Ⓒ with VTVM. If voltage is not within limits (2-5.5 volts) retouch A15. If A15 required adjustment switch receiver and generator to channel 8. If necessary, retouch A30 for response similar to Fig. 5. Recheck A13 and A16 for proper oscillator frequency as in step 11.
20.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	79MC (10MC Swp)	77.25MC 81.75MC	5	Vert. Amp. to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 5. If markers fall below 80% on any channel retouch A35 and A36 for best compromise on all low band channels. Check oscillator injection voltage on each low band channel at point Ⓒ with VTVM. It should be within limits of 2-5.5 volts.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
21.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A17, A30 A31	Check for response similar to Fig. 5 if markers fall below 80% retouch A17, A30 and A31 for best compromise on all high band channels. Check oscillator injection voltage on each high band channel at point Ⓒ. It should be within limits of 2-5.5 volts.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
22		Connect frequency meter as in step 11.	Not used	Freq. meter to 257MC	13	Not used	A18	Adjust individual channel oscillator slug for audible beat on frequency meter on each channel. Check oscillator injection voltage at point Ⓒ on each channel to verify that the voltage is within limits (2-5.5 volts).
				251MC	12		A19	
				245MC	11		A20	
				239MC	10		A21	
				233MC	9		A22	
				227MC	8		A23	
				221MC	7		A24	
				129MC	6		A25	
				123MC	5		A26	
				113MC	4		A27	
				107MC	3		A28	
				101MC	2		A29	

KRK31 UHF TUNER ALIGNMENT FOR MODELS 21-S-348KU THRU 21-S-369KU

Ground the IF transformer, whose adjustment is A8, by connecting one end of a clip lead to tuner chassis and inserting the opposite end through the aperature provided on top of the tuner.
If the oscilloscope available does not have sufficient sensitivity a suitable pre-amplifier may be used.
Fabricate a test dial with marks scribed on its circumference at 0, 9 and 168 degrees. The dial should be made to fit over the split gear on the tuner shaft for accurate alignment. Locate the 0 degree reference point with the capacitor plates fully meshed. To make certain that the plates are fully meshed, place a 1/16" shim between the stop pin on the tuner and the stop plate on the gear assembly.
Connect the high side of the VHF marker signal generator through a 1000Ω carbon resistor to the rear terminal of the IN82 crystal holder.
Connect the UHF marker signal generator loosely to the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
23.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	887.5MC	41.25MC (Use max. sweep width) 43.5MC 45.75MC 887.5MC	83 (088 degree on tuning dial)	Vert. Amp. (thru pre-amp if needed) to point Ⓒ. Low side to chassis.	A37 A38 A39	Adjust A37 and A38 for maximum amplitude overcoupled response curve centered at 887.5MC similar to Fig. 6. Adjust A39 until the 43.5MC marker coincides with the 887.5MC marker. The 41.25MC and 45.75MC markers should be symmetrically located on top of response curve as in Fig. 6.

RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (CH. KC58, A, F, H)

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	"	"	473.5MC (Use max. sweep width)	41.25MC 43.5MC 45.75MC 473.5MC	14 (9 degrees on tuning dial)	"	A40	Adjust A40 until 43.5MC marker coincides with 473.5MC marker. The 41.25MC and 45.75MC markers should be symmetrically located on top of the response curve as in Fig. 7. If necessary, the oscillator coil, L7, may be repositioned to bring the oscillator trimmer adjustment (A40) within range. Repeat steps 23 and 24 until proper responses are obtained.
25.	Tune thru entire UHF range and check tracking. If the 41.25MC and 45.75MC markers fall below 70% on any UHF channel it will be necessary to bend the RF plates to correct the mistracking. The plates may be bent by inserting a knife blade thru the two holes provided on the left side of the tuner. Knife the plates while tuning lower in frequency, so that tracking above the point of knifing will not be disturbed. A check of the section requiring knifing may be made by touching the plates with the knifing tool while noting the effect on the response curve. Connect the DC probe of a VTVM to point (G). Common to chassis. Tune thru the entire UHF range of the same time noting the reading on the VTVM. Readings between 0.05 and 0.4 volt should be obtained. If voltages outside this limit are obtained it indicates low B+ voltage, low or high crystal impedance or an oscillator tube outside allowable limits. If the oscillator tube is replaced steps 23 and 24 should be repeated. Continue alignment with step 29.							

KRK22D TUNER ALIGNMENT FOR MODELS 21-S-348K THRU 21-S-369K

A tuner unit which is operative and requires only minor touch up adjustment will require no presetting of adjustment. Where complete alignment is necessary make the following adjustments:

Preset A13 all the way out.

Set channel 7 to 13 oscillator slugs one turn from tight.

Adjust A12 so that the slug is all the way out.

Do not alter any of the antenna matching unit adjustments.

Disconnect the link from terminals "A" and "B" of the first video IF transformer and terminate the link with a 39Ω carbon resistor.

Tuner alignment as outlined below requires the use of a heterodyne frequency meter.

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to point (E) Low side to chassis.	Not used	43.5MC (400∿Mod)	2	Vert. Amp. to point (F). Low side to chassis.	A14	Short the tuner AGC terminal to ground with a short jumper. Adjust the scope for maximum gain and the signal generator for maximum output. Adjust A14 for MINIMUM 400∿ indication on scope.
11.		RF input of heterodyne frequency meter to end of insulated wire inserted in hole provided for adjustment of A17.	Not used	Set freq. meter to 227MC.	8	Not used	A15, A16, A13	Connect the potentiometer arm of one of the bias supplies to the tuner AGC terminal. Connect the positive lead to tuner chassis. Adjust for -3 volts at tuner AGC terminal. Preset A15 for -3 volts on VTVM at point (F). (limits of oscillator injection are 2 - 5.5 volts). Turn the fine tuning control maximum clockwise. Adjust A16 for audible beat on frequency meter. Adjust A13 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mid-range position.
	NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A16, switch to channel 13 and adjust A18 for channel 13 oscillator frequency, then switch to channel 12 and adjust A19 for channel 12 oscillator frequency. Continue down to channel 8 adjusting proper oscillator trimmer to obtain proper oscillator frequency on each channel. Also, on channel 8, adjust A16 for channel 8 oscillator frequency. Switch to channel 13 and adjust A18, then switch back to channel 8 and adjust A16 again.							
12.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point (F). Low side to chassis.	A30, A17, A31, A32	Set A12 to maximum counter clockwise rotation. If separate marker generator is used couple it loosely to antenna terminals. Adjust scope for maximum gain and attenuate sweep generator output for a MINIMUM signal input that will produce a usable pattern on scope. Adjust A30, A17, A31 and A32 for response similar to Fig. 5. Adjust A32 for maximum amplitude between markers. A31 affects frequency of pass band. A30 affects tilt (if A32 is properly adjusted) and A17 affects band width.
13.	Connect the DC probe of VTVM to point (F). Common to chassis. Adjust A15 for -3 volts at point (F). Readjust A13, A17, A30, A31 and A32 for response similar to Fig. 5. Adjust A32 for maximum gain at mid-point of response curve. If necessary, repeat until desired response is obtained.							
14.		Connect frequency meter as in step 11.	Not used	Freq. meter to 257MC	13	Not used	A18, A13	Turn the fine tuning control maximum clockwise. Adjust A18 for audible beat on frequency meter. SLIGHTLY overshoot the adjustment an additional turn in the same direction and then adjust A13 to again obtain an audible beat.
15.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (F). Low side to chassis.	A33, A34	Adjust for response similar to Fig. 5. Turn off the sweep generator and check the oscillator injection voltage at point (F). Voltage should be within limits (2-5.5 volts) If A15 required readjustment turn sweep generator back on and recheck channel 13 response. If necessary, retouch A33 and A-34 to obtain desired response.
16.		Connect frequency meter as in step 11.	Not used	Freq. meter to 227MC	8	Not used	A13	Check for audible beat on frequency meter. If necessary, readjust A13 for proper oscillator frequency.
17.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point (F). Low side to chassis.	A30, A17 A31, A32	If necessary, retouch A30, A17, A31 and A32 to obtain response similar to Fig. 5. Turn off the generators and switch back to channel 13 and check the oscillator injection voltage at point (F) with VTVM. If the oscillator injection trimmer, A15, was far off, it may be necessary to repeat steps 15, 16 and 17 several times before proper setting of A15 is obtained.
18.		Connect frequency meter as in step 11.	Not used	Freq. meter to 129MC	6	Not used	A25	Set fine tuning control to its mid-range position. Adjust A25 for audible beat on frequency meter.

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ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point (F). Low side to chassis.	A35, A36 A41	Adjust for response similar to Fig. 5. Check oscillator injection voltage at point (F) with VTVM. If voltage is not within limits (2-5.5 volts) retouch A15. If A15 required adjustment switch receiver and generator to channel 8. If necessary, retouch A30 for response similar to Fig. 5. Recheck A13 and A16 for proper oscillator frequency as in step 11.
20.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response similar to Fig. 5. If markers fall below 80% on any low band channel retouch A35, A36 and A41 for best compromise on all low band channels. Check oscillator injection voltage on each low band channel at point (F) with VTVM. It should be within limits of 2-5.5 Volts.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
21.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A17 A30 A31	Check for response similar to Fig. 5. If markers fall below 80% retouch A17, A30 and A31 for best compromise on all high band channels. Check oscillator injection voltage on each high band channel at point (F). It should be within limits of 2-5.5 volts.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
22.		Connect frequency meter as in step 11.	Not used	Freq. meter to 257MC	13	Not used	A18	Adjust individual channel oscillator slug for audible beat on frequency meter on each channel. Check oscillator injection voltage at point (F) on each channel to verify, that it is within limits (2-5.5 volts). Continue alignment with step 26.
				251MC	12		A19	
				245MC	11		A20	
				239MC	10		A21	
				233MC	9		A22	
				227MC	8		A23	
				221MC	7		A24	
				129MC	6		A25	
				123MC	5		A26	
				113MC	4		A27	
				107MC	3		A28	
				101MC	2		A29	

KRK22D ANTENNA MATCHING UNIT ALIGNMENT

The antenna matching unit has been properly aligned at the factory and normally will require no further adjustment. The RF unit is aligned with a particular antenna matching unit in place.
If a new antenna unit is installed, the RF unit should be realigned. Alignment should not be attempted without the proper alignment facilities.
The FM trap (A42) may be aligned without adversely affecting the alignment of the unit.
Disconnect the lead from the FM trap to the channel selector switch. Use a short jumper to connect point (E) on the matching unit through a .001MFD capacitor to Pin 1 (grid) of the second IF amplifier tube (6CB6). Remove the first video IF amplifier tube (6CB6) from its socket.
The matching unit cover must be in place during alignment. Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery. Connect the positive side to chassis. Connect the potentiometer arm to point (D). Adjust the potentiometer arm for a -5volts at point (D).
Scope to be used should have a sensitivity of approximately 0.03 volts per inch.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
26.	Two 130 Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used	45.75MC (400~Mod)	Any	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A43	Set scope for maximum gain. Adjust for MINIMUM 400~ response on scope.
27.	"	"	"	"	"	"	A44	"
28.	"	"	50MC (20MC Swp)	50MC 52MC 53MC 60MC	"	Vert. Amp. thru detector (Fig. 1) to point (E). Low side to chassis.	A45, A46	Remove the .001MFD capacitor (see instructions above) from point (E) and connect a 300Ω, ½ watt carbon resistor from point (E) to chassis using very short leads. Set the scope gain for maximum. If a second signal generator is used to provide markers it should be connected loosely to the antenna matching unit antenna terminals. Adjust to obtain response curve similar to Fig. 8. A45 affects positioning of the shoulder on the response curve at 52MC while A46 should be adjusted for maximum amplitude from 53MC and above as shown in Fig. 8. If necessary, repeat adjustments until no further improvement is noted. Remove the 300Ω resistor and detector probe. Restore the connection between point (E) and the channel switch. Replace the first video IF amplifier tube in its socket.

KRK31 ANTENNA MATCHING UNIT ALIGNMENT

Follow the procedure outlined under "KRK22D antenna matching unit alignment".

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
29.	.01MFD	High side to point (H). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (H). Common to chassis.	A47, A48	Attenuate generator output to maintain 5 volts at VTVM. Adjust for maximum deflection.
30.	"	"	"	"	DC probe to point (J). Common to chassis.	A49	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 29 and 30 until no further improvement is noted.

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
29.	.01MFD	High side to point (H). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering Channel	Vert. Amp. to point (H). Low side to chassis.	A47, A48	Disconnect stabilizing capacitor C80. Adjust for curve of maximum amplitude and symmetry similar to Fig. 9.
30.	"	"	"	"	"	Vert. Amp. to point (J). Low side to chassis.	A49	Reconnect stabilizing capacitor C80. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 10. SLIGHTLY re-touch A48 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

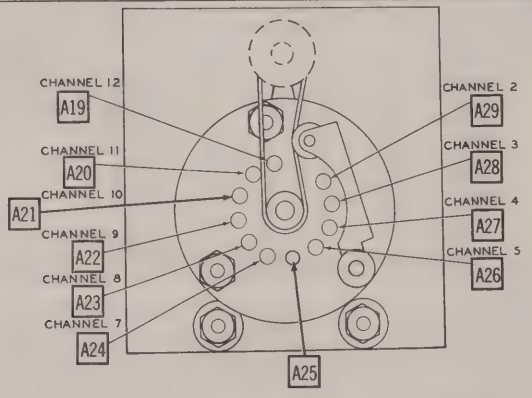
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
31.	1500MMF	High side to point (B). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig.1) to pin 6 (plate) of video output tube 12AU7 (V8). Low side to chassis.	A50	Adjust generator output for 0.5 volt at point (B). Short pin 1 (grid) of the third video IF amplifier tube 6CB6 (V6) to chassis. Adjust for MINIMUM 400∿ indication on scope. Remove short from pin 1 of V6.

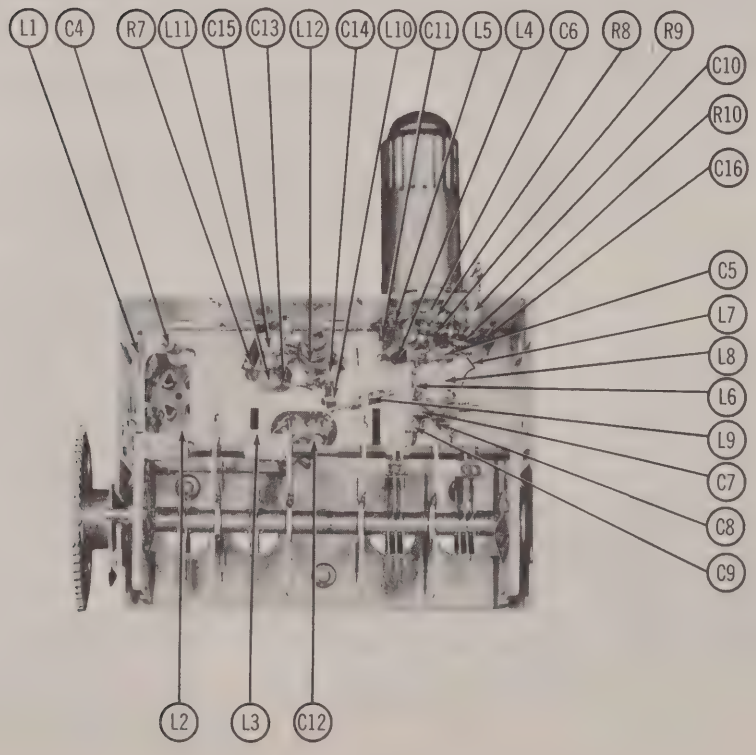
ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning control for clearest picture and best sound. Note whether a 4.5MC beat is present in the picture. If a 4.5MC beat is present turn the fine tuning control slightly clockwise to emphasize the 4.5MC beat interference and then adjust A50 to minimize the 4.5MC beat in the picture.

FM TRAP ADJUSTMENT

The FM trap adjustment (A42) may be made in the field when interference due to a strong FM station occurs. Tune in the station on which the interference is observed and adjust A42 to minimize the interference.





UHF TUNER- RIGHT SIDE

TUBE PLACEMENT CHART

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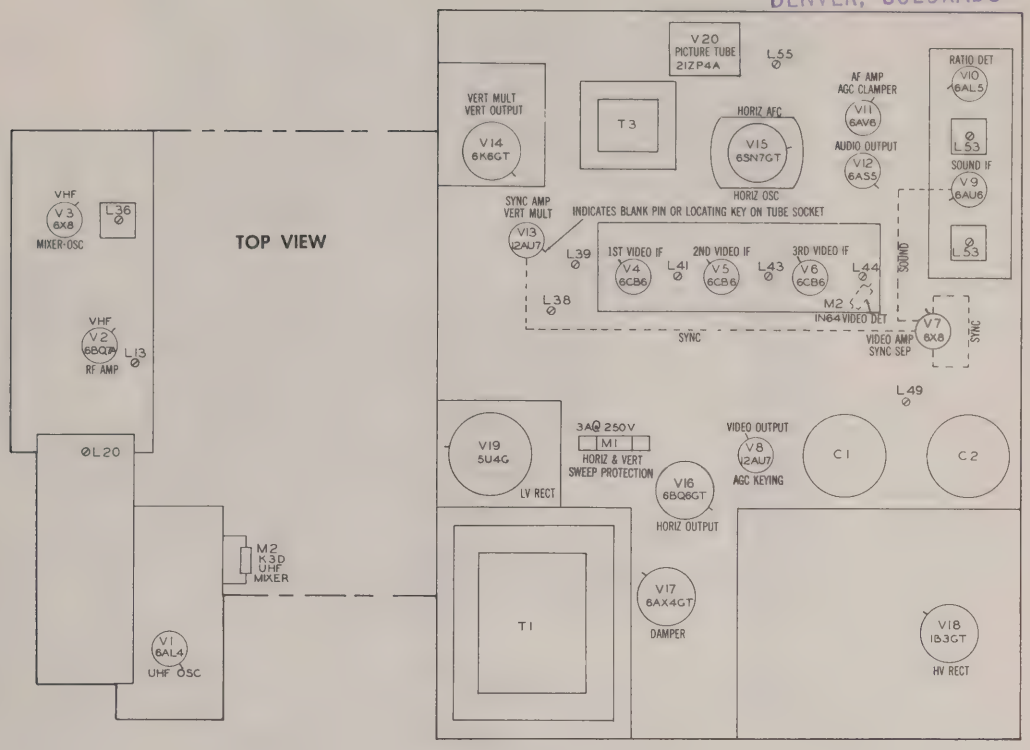

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V12(V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V8, V20
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8, V11

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V15
No vert. or horiz. sync - V7, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20, Fuse (M1)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V15

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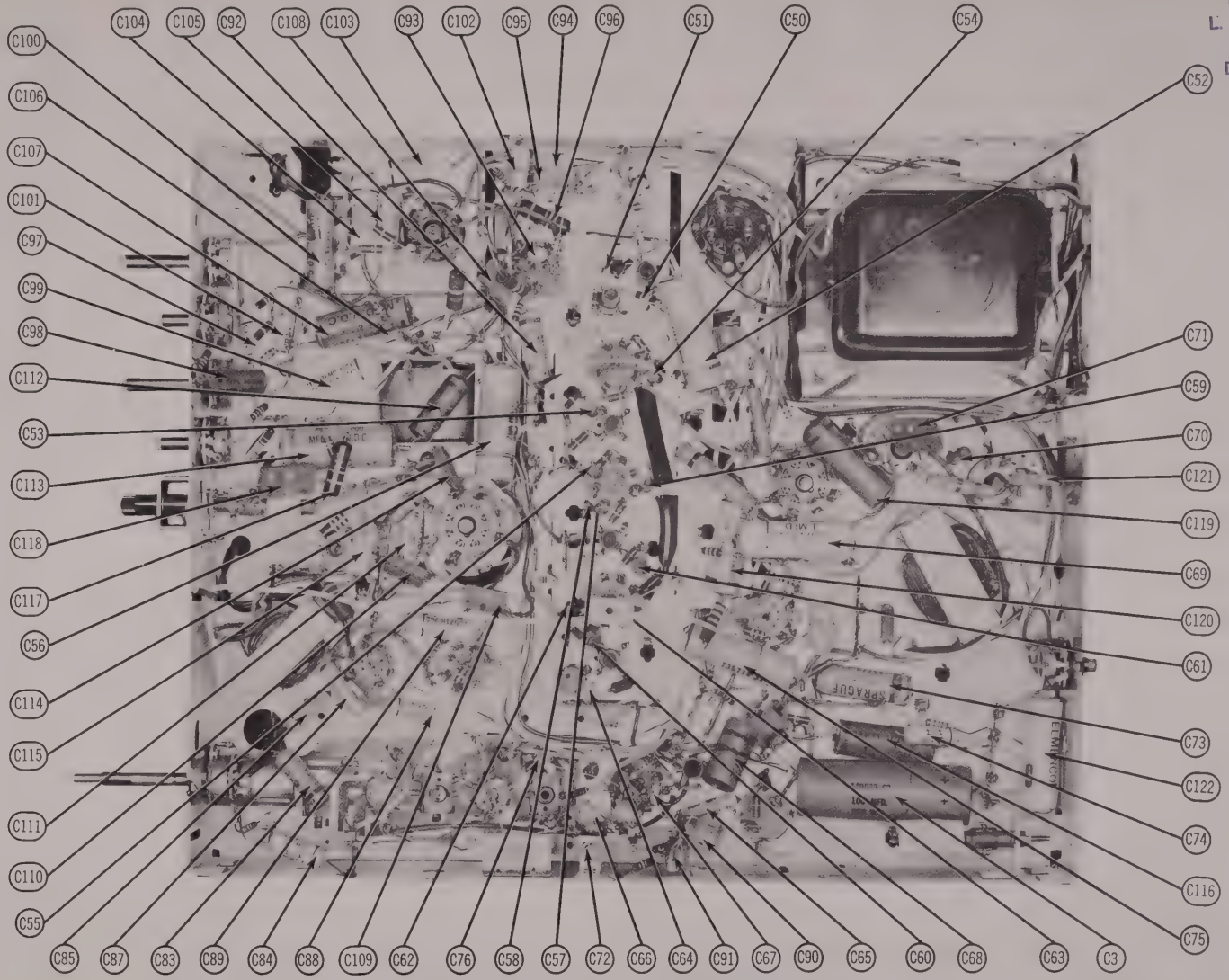

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
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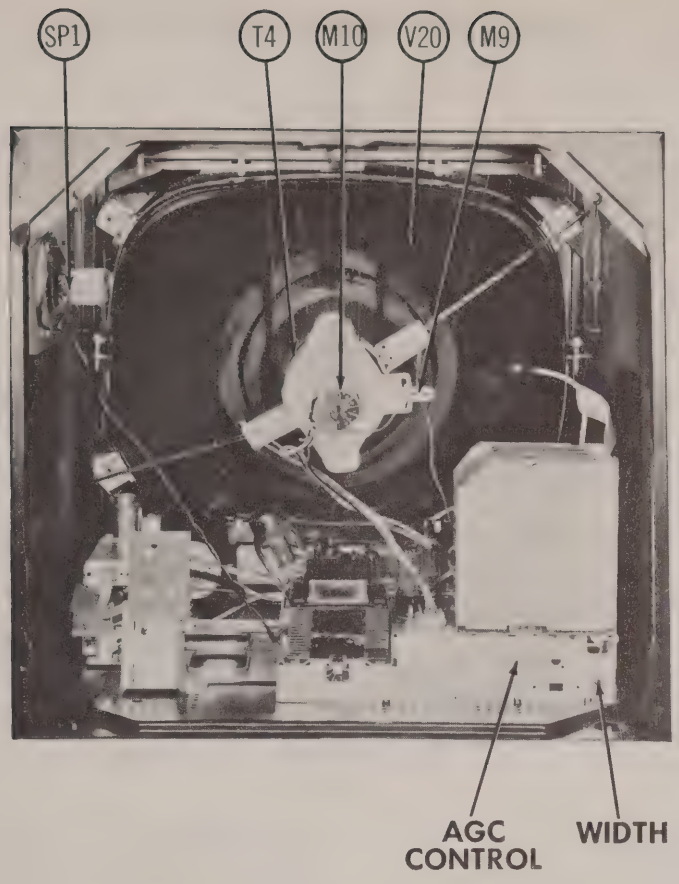

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal frequency adjustment clockwise until picture loses sync then slowly turn the horizontal frequency adjustment counter clockwise until picture just pulls into sync. Continue turning horizontal frequency adjustment counter clockwise two full turns. If picture does not remain in sync the following adjustments should be made:

Turn the horizontal drive trimmer (B1) maximum clockwise then back off one full turn. Preset the width coil slug (B3) so that the core stud is flush with the inside of the chassis. Adjust the waveform slug (B2) maximum counter clockwise.
Turn the horizontal frequency adjustment counter clockwise. Several diagonal bars should appear before the circuit begins to'motor-boat". Adjust B2 for 3 or 4. diagonal bars before motor boating occurs when the horizontal frequency adjustment is turned counter clockwise from the point where the picture just loses sync. If the picture cannot be made to sync properly after the above adjustments are made it will be necessary to perform the horizontal waveform adjustments.

HORIZONTAL WAVEFORM ADJUSTMENTS
Turn B1 maximum clockwise then back off one full turn. Preset B3 so that core stud is flush with the inside of the chassis.
Connect a jumper across the horizontal phase coil, L55, and turn the horizontal frequency adjustment until picture pulls into sync .
Remove the jumper across L55.
Connect the low capacity probe of oscilloscope to junction of L54, L55 and R104.
Turn the horizontal frequency adjustment clockwise until picture loses sync, then counter clockwise until picture just falls into sync.
Adjust B2 for broad and narrow peaks of equal height as in Fig. 11. If necessary keep the picture in sync while adjusting B2 by turning the horizontal frequency adjustment.
Remove the oscilloscope.

HORIZONTAL DRIVE ADJUSTMENT (For Correct Locking Range).
Turn the horizontal frequency adjustment until the picture loses sync with diagonal bars sloping down to the right.
Slowly turn the horizontal frequency adjustment counter clockwise noting the number of diagonal bars present just before the picture locks in into sync.
One and one half to three bars should be present just before picture pulls into sync.
Turn B1 counter clockwise as far as possible without the presence of a vertical white line near the center of the picture.
Turn the brightness control fully clockwise and adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally. Readjust the brightness control for normal brightness .
The picture should lock in with one and one half to three bars present. The picture should not lose sync as the horizontal frequency adjustment is turned two full turns counter clockwise from the lock in point. When the picture falls out of sync between two and five bars should be present before motorboating occurs.

AGC CONTROL ADJUSTMENT
Connect the vertical amplifier of the oscilloscope to pin 6 (plate) of the video output tube (V8/12AU7).
Tune in a strong station and adjust scope to observe video waveform. Rotate the AGC control clockwise until sync pulse tips begin to be compressed then counter clockwise until the compression just disappears.

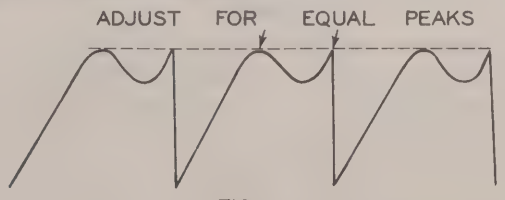

FIG. 11

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17 and V19. Check adjustments B1 and B3. Check R111, R110, C120, C118, T2, T4A and other associated components.

DRIVE LINES

Check by substitution V16 and V17. Check adjustment B1. Check T2, T4A, C118, R110 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V16 and V17. Check adjustment B3. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V15, V16 and V17. Check horizontal frequency alignment Check C112 for open. Check other components associated with V15.

XMAS TREE EFFECT

Check by substitution V15, V16 and V17. Check T2 and T4A for internal arcing. Check L54, L55, R104, R107, C115, C110 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V13 and V14. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T3, T4B, C105 and other associated components.	Check C95, C101, C98, R2, R87 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check height and vertical linearity controls for proper operation. Check T3 and T4B.

COMPRESSED AT BOTTOM

Check by substitution V13 and V14. Check R2, R87, C96, C97 and other associated components.

COMPRESSED AT TOP

Check by substitution V13 and V14. Check R97, R96, R4, R95 and other associated components.

FOLDS

Check by substitution V13 and V14. Check C99, C98, C100, R92, R94, R91, T3, T4B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V7 and V13. Check R75, R79, R78, R85, R83, C90, C92 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V13. Check C95, C96, C94, R84, R88, R5, R97 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V15. Check C109, C108, C113, C114, R118, R104, R101, L54 and other components associated with V15.

HORIZONTAL BENDING

Check by substitution V7, V13 and V15. Check components associated with V15.

VIDEO

LOSS OF VIDEO

Substitute V8. Check C68, C69, R52, R47, L48, L50 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustments A50. Check video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control and picture tube. Check R51, R49, L47, L48, L51 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check video crystal detector network. Check AGC network. Check picture tube, C66, C69, L47 and other associated components.

SMEAR

Check by substitution V7 and V8. Check L45, L46, L47, L48, L50, L51, C66, R49 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C85, C88, C89, R71, R74, C3, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A49. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light check AC interlock assembly. Check switch on volume control and T1. If filaments light check by substitution V19. Check for deflection yoke plug to be loose or out of socket. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V19. Check B+ filter and decoupling network.

TROUBLE SHOOTING AIDS (cont)

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HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V15, V16, V17 and V18. Check M1 fuse. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C122, C121, C119, C120, R111, R110, and other associated components.	Check C118, C114, L54, L55, R107 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check R111, R110, C120, C118, T2, T4A and other associated components.

BLOOMING

Check by substitution V16, V17, V18 and V19. Check R111, R120, T5, C118 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE (VHF)

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V12. Check video IF components for failure or change of value.

RASTER, NO SOUND, NO PICTURE (UHF)

Check by substitution V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

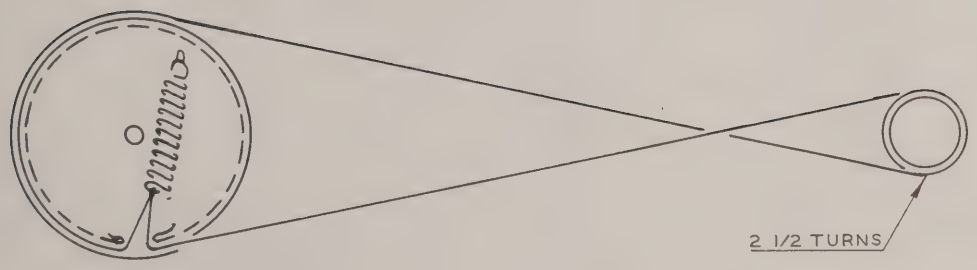
KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

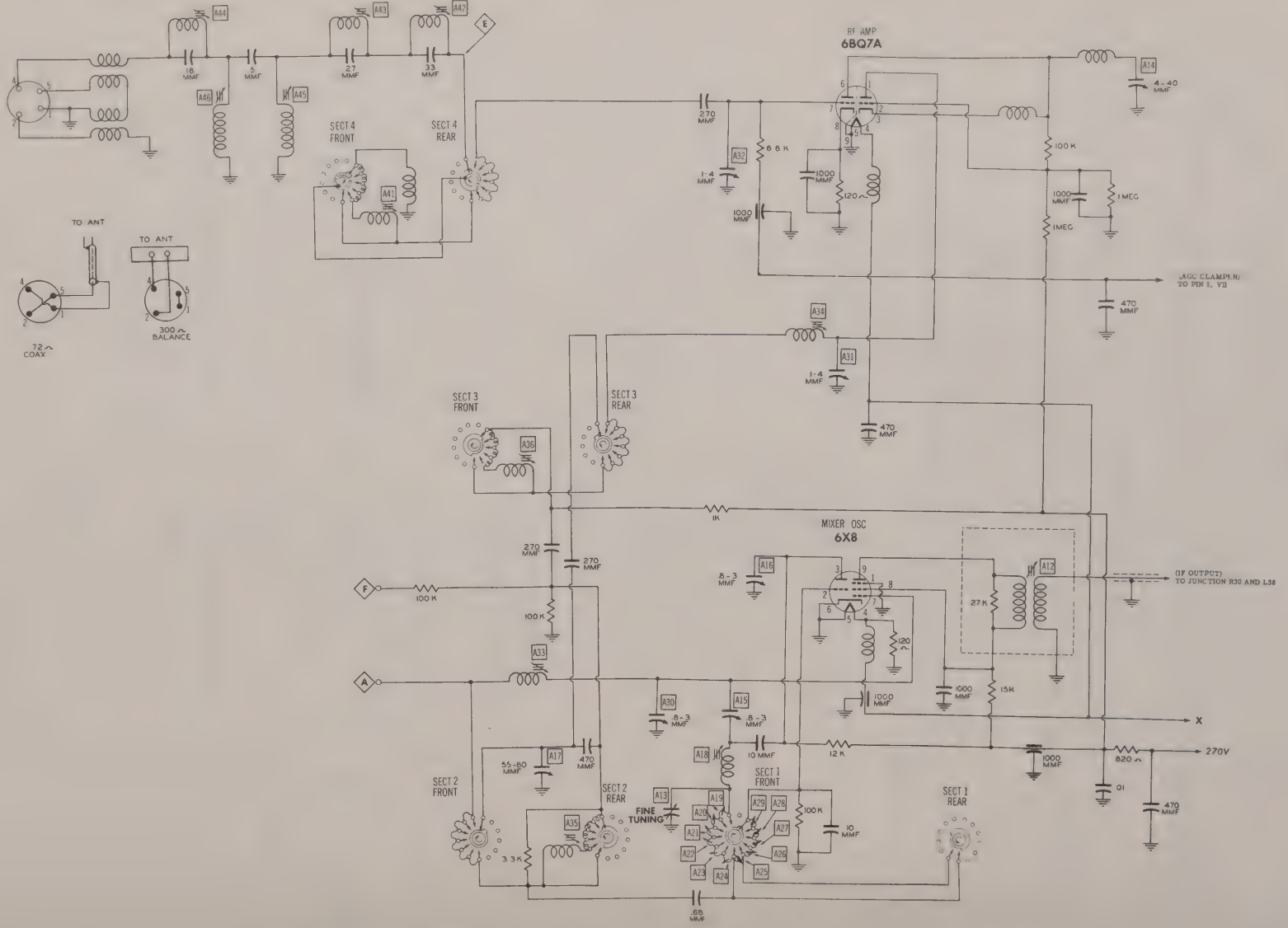
Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



TUNING GANG FULLY COUNTER—CLOCKWISE POSITION.

UHF DRIVE CORD STRINGING



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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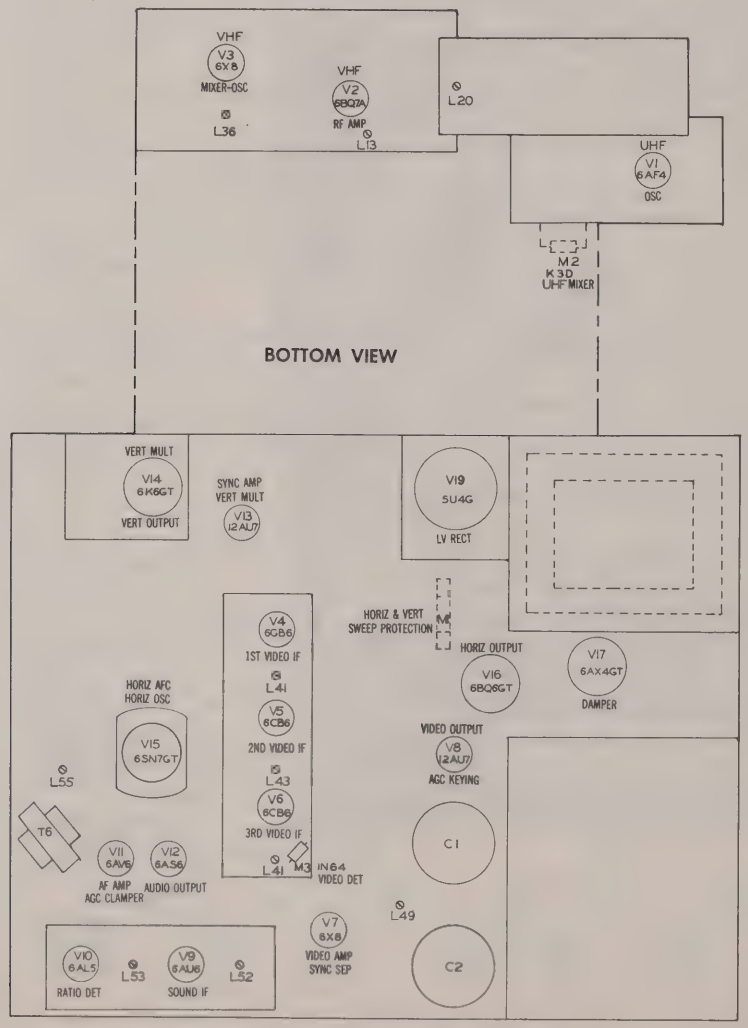
VHF TUNER KRK-22D USED ON CHASSIS KCS 88 AND KCS 88A

ALTERNATE TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■†15KΩ	9KΩ	.1Ω	0Ω	0Ω	9KΩ	■†15KΩ		
V 2	6BQ7A	†1.8KΩ	700KΩ	INF	0Ω	.1Ω	INF	300KΩ	120Ω	0Ω
V 3	6X8	0Ω	100KΩ	†15KΩ	.1Ω	0Ω	0Ω	100KΩ	†15.8KΩ	†15.8KΩ
V 4	6CB6	34KΩ	68Ω	0Ω	.1Ω	▲680Ω	▲680Ω	0Ω		
V 5	6CB6	150KΩ	▲18Ω	0Ω	.1Ω	†700Ω	†700Ω	INF		
V 6	6CB6	.2Ω	180Ω	.1Ω	0Ω	‡470Ω	‡470Ω	0Ω		
V 7	6X8	0Ω	2.2Meg	‡1.2Meg	0Ω	.1Ω	120Ω	3.9KΩ	‡4.7KΩ	‡16.7KΩ
V 8	12AU7	233KΩ	‡33KΩ	‡0Ω	.1Ω	.1Ω	†7.5KΩ	470KΩ	8KΩ	0Ω
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	‡1KΩ	‡1KΩ	120Ω		
V 10	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	10Meg	0Ω	.1Ω	0Ω	300KΩ	300KΩ	†330KΩ		
V 12	6AS5	15KΩ	†600KΩ	.1Ω	0Ω	†600KΩ	†500Ω	†885Ω		
V 13	12AU7	‡14KΩ	33KΩ	1.2KΩ	.1Ω	.1Ω	♦2Meg	2.7Meg	0Ω	0Ω
V 14	6K6GT	INF	0Ω	†700Ω	†80Ω	2.5Meg	INF	.1Ω	0Ω	
V 15	6SN7GT	1.5Meg	†80Ω	230KΩ	250KΩ	†37KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	INF	0Ω	100Ω	†12KΩ	1Meg	INF	.1Ω	100Ω	TOP CAP ♦21Ω
V 17	6AX4GT	INF	INF	1Meg	INF	†40Ω	INF	.1Ω	0Ω	
V 18	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ♦400Ω
V 19	5U4G	INF	50KΩ	INF	30Ω	INF	28Ω	INF	50KΩ	
V 20	21ZP4A	0Ω	470KΩ	PIN 10 ♦320KΩ	PIN 11 †270KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V19
■ MEASURED IN UHF POSITION
▲ MEASURED FROM PIN 7 OF V5
‡ MEASURED FROM 150V LINE
♦ MEASURED FROM PIN 3 OF V17



TUBE PLACEMENT CHART

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DENVER, CO 80211

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

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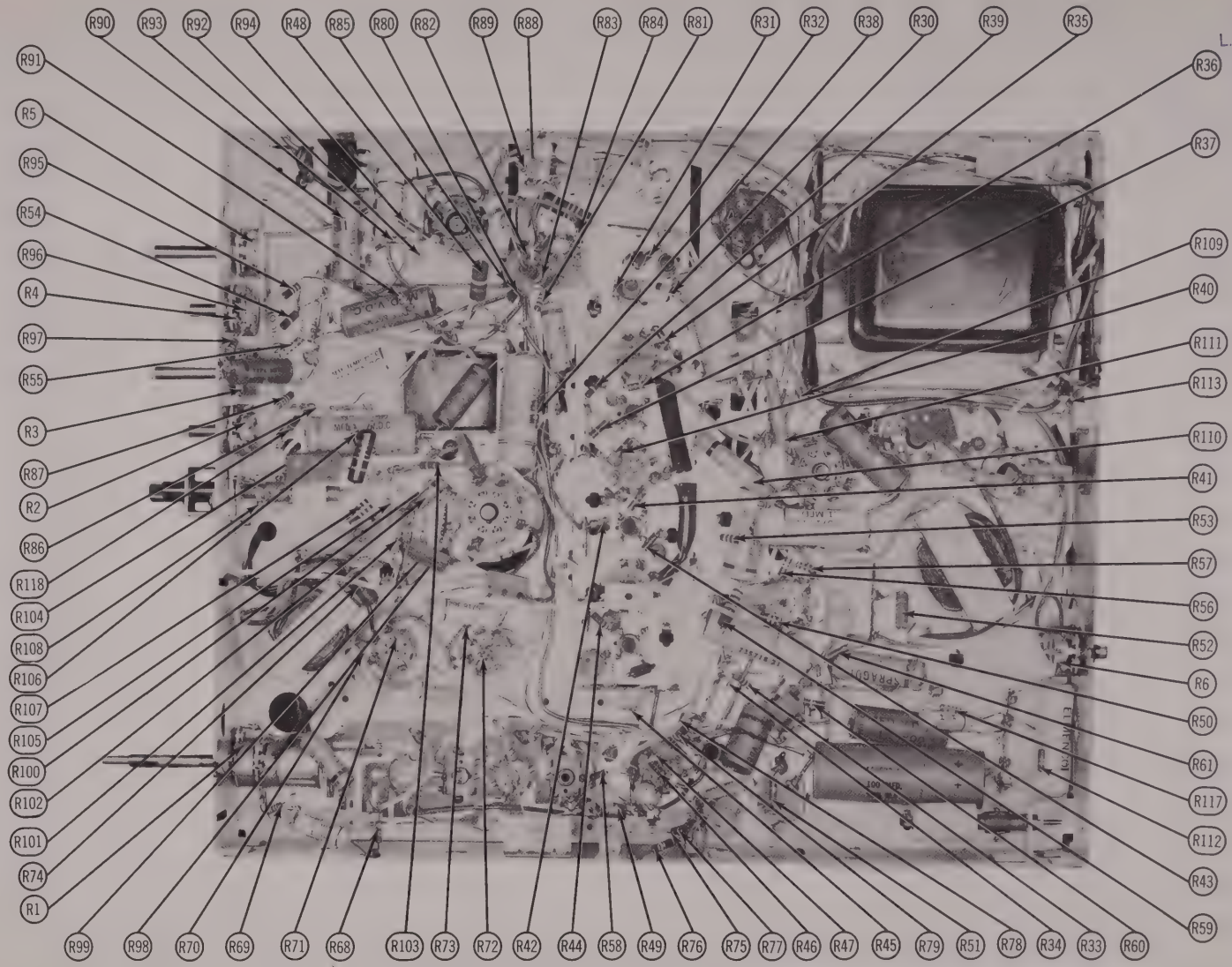

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BQ7A	6BQ7A	9AJ	
V3	VHF Mixer-Osc.	6X8	6X8	9AK	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Amp.-Sync Separator	6X8	6X8	9AK	
V9	Video Output-AGC Keying	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amp.-AGC Clamper	6AV6	6AV6	7BT	
V12	Audio Output	6AS5	6AS5	7CV	
V13	Sync Amp.-Vert. Mult.	12AU7	12AU7	9A	
V14	Vert. Mult.-Vert. Output	6K6GT	6K6GT	7S	
V15	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6AX4GT	6AX4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	RCA Victor PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V20	21ZP4A 21ZP4B	21ZP4A 21ZP4B	21ZP4A 21ZP4B	21ZP4A 21ZP4B 21ZP4 ①	21ZP4A 21ZP4B	12N 12N 12D	① Circuit change necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲80	400	79147	AFH3-159		C118		FP375.5	TVL-3720	
B	▲80	200								
C2A	▲100	400	79146	AFH4-85		C152		FP389.1	TVL-3672	
B	▲30	50								
C3	100	250	79314	PRS450/40-40		BBRD7V225		FP129.1	TVL-1535	
C4	2.2		71502							
C5	.6-1.4		78259							
C6	1									
C7	.6-1.4		78259							
C8	.51		78137							
C9	.62		78260							
C10	1000		77084	EF-001	MFT-1000				503C-D1	
C11	1000		77084	EF-001	MFT-1000				503C-D1	
C12	22		78261	SI22NP0	TCZ-22	TZ14	NP0K-220	ZT-5422	5TCC-Q22	
C13	1000		77084	EF-001	MFT-1000				503C-D1	
C14	7		78262							
C15	33		70596	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C16	1000		77084	EF-001	MFT-1000				503C-D1	
C17	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C18	18		54207	SI18NP0	TCZ-18	TZ12	NP0K-180		5TCC-Q18	
C19	5		3056	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C20	27		70935	SI27NP0	TCZ-27	TZ16	NP0K-270		5TCC-Q27	
C21	33		76739	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C22	3.3			SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C23	270		75199	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C24	1-4		76532		829-4		3115-01-10			
C25	1000		77084	EF-001	MFT-1000				503C-D1	
C26	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C27	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	270		75199	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C29	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C31	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C32	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C33	.8-3		77151		829-3		3115-01-0R5			
C34	270		75199	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C35	2.2		71502	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C36	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C37	1000		77084	EF-001	MFT-1000				503C-D1	
C38	150		78276	SI150	D6-151	TP36	GP2K-151	UC-5315	5GA-T15	
C39	100		75437	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C40	.8-3		77151		829-3		3115-01-0R5			
C41	.8-3		77913				532-08-0R5			
C42	.8-3		77151		829-3		3115-01-0R5			
C43	10		77865	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C44	10		78247	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C45	.68		71504		TCZ-.68	TZ02	NP0K-R68			
C46	1000		77084	EF-001	MFT-1000				503C-D1	
C47	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1000		77084	EF-001	MFT-1000				503C-D1	
C49	1000		77084	EF-001	MFT-1000				503C-D1	
C50	15		39044	SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C51	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C52	.47	200	73787	P288-47		CUB2P47		PT4047	2TM-P47	
C53	470		77293	BPD-00 047	D6-471	K060	821-471	UC-5347	5GA-T47	
C54	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C56	.39	200	79318			PM4P39				
C57	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C58	470		77293	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C59	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C60	1000		78823	BPD-001	DD-102	K069	801-001	DC-521	5HK-DI	
C61A	1000		79319	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-3D1	
B	1000									
C62	470		77283	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C63	½		79164							
C64	10		33098	S110NP0	TC2-10	TZ09	NP0K-100	ZT-541	5TCC-Qi	
C65	.0039	400	79018	1464-004		PME039		MCB463	MS-24	
C66	47		33042	S147N750	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C67	8		77384							
C68	.1	600	79149	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C69	.1	600	73557	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C70	470									
C71	470	500	59667	1469-0005		5R5T47		MCB345	MS-35	Note 1
C72	100		39396	S100NP0	TC2-100	TZ09	NP0-333-101	ZT-531	5TCC-T1	
C73	.047	600	73592	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C74	.0022	600		P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C75	.33	200	78094			PME3P33				
C76	3		76507	S13.3NP0	TC2-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-Y33	
C77	39		79323							
C78	56		79324	S156N750	TCN-56	TN16	N750K-560	NT-5456	5TCU-Q56	
C79	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C80	.47	200	79148	P288-47		CUB2P47		PT4047	2TM-P47	
C81	1000	500	39052	1469-0035		5R5T35		MCB255	MS-21	
C82	.0033	400	79315	P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C83	.0047	400	79017	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 2
C84	.01	200	79316	P688-01	D6-103	CUB6D1	GP2-333-103	PT611	6TM-D1	
C85	.01	200	79014	P688-01	D6-103	CUB4B1	GP2-333-103	PT411	4TM-B1	
C86	.0027	600	73598			PME6D27				Note 1
C87	.001	600	75643	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	Note 3
C88	.0027	600	73599			PME6D27				
C89	.0082	1000				PME10B2				
C90	.1	400	73551	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C91	330	500	39640	1469-00035		5R5T35				
C92	.033	400	73552	P688-033		PME633		PT6133		
C93	470		78823	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C94	.0082	400	79019			PME6D82				
C95	.0033	600	79315	P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C96	.0039	400	78221	1464-004		PME039		MCB463	MS-24	
C97	.1	400	73551	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C98	.01	600	73594	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C99	.056	600	79317			PME6S56				
C100	.068	200	73792			PME6S68				
C101	.022	600	73798	P688-022	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C102	.022	600	73595	P688-022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C103	.015	400	73797	P488-015		CUB6S15		PT6115	6TM-S15	
C104	.022	600	73798	P688-022		CUB6S22		PT6122	6TM-S22	
C105	.001	1800	78960	P588-001	DD30-102	CUB6S1	3KV-102	PT1621	MS-D1	
C106	.022	600	73798	P688-022	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C107	.1	400	73551	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C108	220	500	39636			2SR5T22		MCB240		
C109	82	1000	76474							
C110	68	1000	76475							
C111	.1	400	73551	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C112	.022	400	73562	P488-022	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C113	.47	200	73787	P288-47		CUB2P47		PT4047	2TM-P47	
C114	330	1000	76476							
C115	.01	500	73594							
C116	.1	500	73557	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C117	.0012	500	76095			1R5D12				
C118	470	500		1469-0005		5R5T47		MCB345	MS-35	Note 4
C119	.1	500	73557	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C120	.27	200	73788			PME4P27				
C121	270	1000	79022							
C122	.047	1000	73597	P1088-047		CUB16S47		PT1647	MB-S47	
C123	82	6000	77836							Note 1
C124	91									

Note 1. Not used in all versions.
Note 2. Some models use .01MFD in this application (part #79014).
Note 3. Some models use 270MMF in this application (part #4761?).
Note 4. Some models use 680MMF in this application (part #76479).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	RCA Victor PART No	IRC PART No.	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	10K Ω	½	78208	* Q1-304	RTV-443	F1-25	UF16L	Contrast-Panel
B	½ Meg	½				R3-57	UR16-T254 †	Volume tapped @ 250KΩ-Rear
C	Switch					KB-1	US-26	Attach to R1B
R2A	3.5Meg	½	78808	B11-141	A47-5Meg-A	AB-88	SU-59	Height
B	Shaft		Not Req.	T.M-3 Kit	K2S-3	AK-1	Not Req.	Attach to R2A
R3A	200KΩ	½	79139	Q11-129	A47-200K-S	AB-48	U-43	Brightness
B	Shaft		Not Req.	Not Req.	RS-3	AK-4	Not Req.	Attach to R3A
R4A	2.5Meg	½	78807	B11-139	A47-2.5Meg-S	AB-83	SU-565	Vert. Linearity
B	Shaft		Not Req.	T.M-3 Kit	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	1.5Meg	½	78210	Q11-138	A47-2Meg-A	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	K2S-3	AK-4	Not Req.	Attach to R5A
R6A	500KΩ	½	78808	B11-133	A47-500K-S	AB-59	SU-50	AGC
B	Shaft		Not Req.	T.M-2 Kit	FKS-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-116 & P1-200 (Panel)
B13-116 & R1-216 (Rear) & SWITCH S8-1.
† Universal Replacement (Mallory exact duplicated Part No. UE7T5S).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R7	100Ω	½		BTS-100	
R8	6800Ω	½		BTS-6800	
R9	2200Ω	½		BTS-2200	
R10	1500Ω	½		BTS-1500	
R11	22KΩ	2		BTS-22K	
R12	27KΩ	½		BTS-27K	
R13	470KΩ	½		BTS-470K	
R14	6800Ω	½		BTS-6800	
R15	120Ω	½		BTS-120	
R16	100KΩ	½		BTS-100K	
R17	1000Ω	½		BTS-1000	
R18	1 Meg	½		BTS-1 Meg	
R19	1 Meg	½		BTS-1 Meg	
R20	8200	½		BTS-820	
R21	1000Ω	½		BTS-1000	
R22	100KΩ	½		BTS-100K	
R23	100KΩ	½		BTS-100K	
R24	33Ω	½		BTS-33	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R25	330Ω	½		BTS-330	
R26	15KΩ	2		BTS-15K	
R27	120Ω	½		BTS-120	
R28	100KΩ	½		BTS-100K	
R29	12KΩ	2		BTS-12K	
R30	1000Ω	½	504210	BTS-1000	
R31	15KΩ	½	503315	BTS-15K	
R32	1000Ω	½	504210	BTS-1000	
R33	33KΩ	½	503333	BTS-33K	
R34	150KΩ 5%	½	502415	BTS-150K 5%	
R35	98Ω 5%	½	502098	BTS-98 5%	
R36	56K 5%	½	502356	BTS-56K 5%	
R37	680Ω	½	50468	BTS-680	
R38	150K 5%	½	502415	BTS-150K 5%	
R39	150KΩ 5%	½	502415	BTS 150K 5%	
R40	18Ω 5%	½	53568	BTS-18 5%	
R41	56KΩ 5%	½	502356	BTS-56K 5%	
R42	68Ω	½	504168	BTS-680	
R43	180Ω 5%	½	502318	BTS-180 5%	
R44	470Ω	½	504147	BTS-470	
R45	39000 5%	½	502339	BTS-3900 5%	
R46	120Ω	½	503112	BTS 120	
R47	470Ω	½	513247	BTS 4700	
R48	15KΩ	2	524315	BTB-33KΩ	
R49	12KΩ	½	503312	BTA-12K	
R50	470KΩ	½	504447	BTS-470K	
R51	820Ω	½	503182	BTS-820	
R52	7500Ω 5%	½	512275		
R53	470KΩ	½	504447	BTS-470K	
R54	150KΩ	½	504415	BTS-150K	
R55	220KΩ	½	503422	BTS-220K	
R56	82KΩ	½	503282	BTS-82K	
R57	33KΩ	½	503333	BTS-33K	
R58	47KΩ	½	503347	BTS-47K	
R59	47KΩ	½	513347	BTA-47K	
R60	120KΩ 5%	½	30180	BTS-120K 5%	
R61	1.6Meg 5%	½	502516		
R62	47KΩ	½	503347	BTS-47K	
R63	120Ω	½	503112	BTS-120	
R64	1000Ω	½	504210	BTS-1000	
R65	39KΩ	½	503339	BTS-39K	
R66	10KΩ 5%	½	502310	BTS-10K 5%	
R67	10KΩ 5%	½	502310	BTS-10K 5%	
R68	47KΩ	½	503347	BTS-47K	Note 1
R69	33KΩ	½	503333	BTS-33K	
R70	10 Meg	½	504610	BTS-10 Meg	
R71	330KΩ	½	504433	BTS-330K	

Note 1. Not used in all versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	556VCT	6VAC	79183	P-8164 ①	P-3077	R-61BC ②			26R33 ③④
	⑤ 1.54A	.220ADC	⑤3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC									
	⑤2.7A									

① Drill new mounting holes.
② Parallel and phase 6.3V ⑤ 6A windings (For Sec.#3 tape 6.3V ⑤ 1.2A winding).
③ Use only one 5V winding.
④ Parallel and phase 6.3V windings for Sec. #3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Horiz. Output Trans.	79145	A-8233* ①	HVO-9* ①	D-19* ①		FB41* ①	FLY-14* ①
T3	Vert. Output Trans.	79143	A-8145 ⑤⑥	A-3036 ⑤	A-99X ⑤		Z1803 ⑤⑭	26S51 ⑤⑯
				⑥	⑥			
T4A	Yoke-Horiz. (13.5MH)	77697 ⑮	DY-9A	MDF-72	Y-17-1		DF502	Y-7
B	Vert. (39MH)							
T5	Width Coil (2.7-17MH)	79144	WC-8	MWC-8 ⑫	WC-12 ⑦		RF800 ⑫ ⑤	WC-18 ⑫

① Drill new mounting holes.
② Use original mounting bracket.
③ Connect as auto transformer.
④ Mount on tuner bracket.
⑤ Complete with 8 contact male connector, capacitor C124, and resistors R114, R115, R116.
⑥ Enlarge mounting hole.
⑦ Connect to coded blue and red terminals.
⑧ Connect to terminals 4 and 6.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
5	7	9	9		9	9
4	6	8	7 & 8		8	7 & 8
3	5	5	5		5	4
2	4	3	3		3	T
1	3	1	1		1	1
Connect Width Coil Across	2 & 1	4 & 3	3 & 1	3 & 1	3 & 1	T & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	RCA Victor PART No.	Stancor PART No	Merit PART No	Triad PART No.	Halldorson PART No	Thordarson PART No.	NOTES
Z6	4.3KΩ	3.3Ω	79159	A-3852	A-3019	S-5Z	Z1002	24S80	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	RCA Victor PART No.	JENSEN PART No	QUAM PART No	NOTES
SP1	5"	PM	3.3Ω	77000	8T-105 Mod. P5-X	5A1	① Used in Models 21-S-362K, KU, 21-S-367K. KU 421-S-369K, KU
	8"	PM	3.3Ω	77873 ①	8T-115 Mod. P8-V	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Trans	0Ω	0Ω	78268				Part of 78257
L2	UHF RF Coil	0Ω						Part of 78257
L3	UHF MixerCoil	0Ω						.33 Microhenry
L4	UHF Osc. Coil	0Ω		77279				
L5	UHF Cathode Choke	0Ω		78267				.15 Microhenry
L6	UHF Osc. Coil	0Ω		78266				
L7	UHF Osc. Coil	0Ω						
L8	UHF Oscillator Coil	0Ω		78265				
L9	UHF Parasitic Suppressor	0Ω		78268				Wound on 470Ω resistor
L10	UHF IF Coil	0Ω		78267				.15 Microhenry
L11	UHF IF Coil	1.7Ω		72218				20 Microhenries
L12	UHF IF Output Coil	.2Ω		78258				
L13	UHF IF Input Coil			78271				Includes core
L14	VHF Ant. Trans	0Ω	.5Ω	78396				
L15	VHF Ant. Trans	0Ω	.5Ω	78396				
L16	VHF IF Trap	0Ω		76542				Includes core
L17	VHF Ant. Shunt Coil	0Ω		76538				Includes core
L18	VHFAnt. Shunt Coil	0Ω		76537				Includes core
L19	VHF IF Trap	0Ω		76541				Includes core
L20	VHF FM Trap	0Ω		76540				Includes core
L21	VHF Ant. Coils	0Ω		78396				Includes stator complete with rotor & coils
L22	VHF Ant. Coil	0Ω		78401				Channel 6
L23	VHF Ant. Coil	0Ω		77959				
L24	VHF FU. Choke	0Ω		77206				
L25	VHF Neut. Coil	0Ω		76562				
L26	VHF RF Coil	0Ω		78466				
L27	VHF RF Coil	0Ω		77921				Channel 13
L28	VHF RF Coil	0Ω		78801				Includes stator complete with rotor coils, cage, , resistors, C36, C35, A21
L29	VHF Mixer Grid Coil	0Ω		77919				Channel 13
L30	VHF Mixer Grid Coils	0Ω		78900				Includes stator complete with rotor, coils, cage, resistors, R23, R25, C23
L31	VHF Mixer Coil	0Ω		78583				
L32	VHF MixerCoil	0Ω		73874				Channel 6
L33	VHF Osc. Coil	0Ω		77915				Channel 13
L34	VHF Osc. Coils	0Ω		77911				Includes stator complete with rotors, coils, & trimmer - C25
L35	VHF Fil. Choke	0Ω		76763				
L36	VHF Conv. Plate	.2Ω	0Ω	78396				
L37	RF Coil	0Ω		78584				
L38	47.25MC Trap	.1Ω		78204	20-1047		6219 *	
L39	1st Video IF	.2Ω	.2Ω	78203	17-4523		6219	
L40	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	
L41	2nd Video IF	.3Ω	.3Ω	78433	17-4523		6219	
L42	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	
L43	3rd Video IF	.2Ω	.2Ω	78433	17-4523		6219	
L44	4th Video IF	.2Ω	.3Ω	78433	17-4523		6219	
L45	Series Peaking Coil	2.8Ω		78011	19-3036	TV-180	6178	35 Microhenries
L46	Shunt Peaking Coil	7.5Ω		98482	19-3250	TV-185	6181	250 Microhenries
L47	Series Peaking Coil	7.5Ω		77674	19-3250 ■	TV-185 ■	6181 ■	250 Microhenries; Wound on 27KΩ resistor
L48	Shunt Peaking Coil	11Ω		79321	19-3250 ▲	TV-185 ▲	6181 ▲	250 Microhenries; sound on 10KΩ resistor
L49	4.5MC Trap	9Ω		79157	17-3402 ▪		1470	
L50	Shunt Peaking Coil	17Ω		75252	19-3500	TV-188	6174	500 Microhenries
L51	Series Peaking Coil	9Ω		71588	19-4180	TV-183	6179	190 Microhenries; wound on 39KΩ resistor

RCA VICTOR MODELS 21-S-348K, KU, 21-S-355K, KU, 21-S-357K, KU, 21-S-362K, KU, 21-S-367K, KU, 21-S-369K, KU (Ch. KCS88, A, F, H)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L52	Sound IF	2.5Ω		79140	16-3445 †	TV-113 †	6203 †	
L53	Ratio Det.	9.5Ω	.6ΩCT	79141	17-3497 ▲	TV-115 ▲	6205 ▲	Tertiary winding .3Ω
L54	Horiz. Osc.	77Ω		79160	20-1402	TV-162	6183	Tapped @ 21Ω
L55	Horiz. Phase Coil	44Ω		79161	20-1402	TV-162	6183	
L56	RF Choke	.72Ω		76640	19-1001		4604	1.5 Microhenries; IRC Part No. CL-1.

* Use one winding only.
■ Parallel with 27KΩ resistor.
▬ Parallel with 10KΩ resistor.
♦ Do not use tap winding.
† Term. suff. mounting support- Use one winding.
▲ Term. suff. mounting support.
¶ Replaces horiz. osc. & horiz. phase coils-cut out chassis hole and drill mounting holes.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L57	220ADC	38Ω	1.3 Hy.	77676	C-2326 ①	C-2996 ①	C-23X	C5037 ①	26C44 ①

① Drill one new mounting hole.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	K3D		1N82 or 1N82A		UHF Mixer (Ch. KCS88F, KCS88H)
M3	1N64	76675	1N60 or 1N132	1N60 or 1N64A	Video Detector

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/10A 250V	78214	78218	312.300 (3/10A-3AG)	357001	AGC 3/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Dial Light	11765	Bayonet #51
M5	Tuner		VHF-KRK29D - Ch. KCS88F, KCS88H
	Tuner		VHF-KRK22D - Ch. KCS88A, KCS88
M6	Tuner		UHF-KRK-27 - Ch. KCS88F, KCS88H
M7	Switch	78429	Ant. - Ch. KCS88F, KCS88H
M8	Switch	78211	TV-Phono, Tone-Ch. KCS88, KCS88F
M9	Focus Magnet	76168	Includes centering device
M10	Ion Trap	76141	
A5	Trimmer Cap.	78220	47.25MC Trap - 5-70MMF
A14	Trimmer Cap.	77616	RF (4-40MMF), KRK22D Tuner
B1	Trimmer Cap.	71807	Horiz. Drive (10-160MMF)
	Knob	79221	Channel Selector -Black-For ebony instruments, Models 21S348K, KU
	Knob	79222	Channel Selector-Brown-For maroon instruments, Models 21S348K, KU
	Knob	79230	Channel Selector -Brown-For maroon instruments, Models 21S355K, KU, 21S362K, KU, 21S367K, KU
	Knob	79226	Channel Selector-Med beige- For oak and mahogany grain instruments - Models 21S357K, KU, 21S369K, KU
	Knob	79077	Fine tuning - Model 21S348K
	Knob	79081	Fine tuning - Model 21S348KU
	Knob	77707	Fine tuning - Models 21S355K, 21S362K, 21S367K
	Knob	78343	Fine tuning - Models 21S355KU, 21S362KU, 21S367KU
	Knob	77717	Fine tuning - Models 21S357K, 21S369K
	Knob	78432	Fine tuning - Models 21S357KU, 21S369KU
	Knob	79080	Contrast- Models 21S348K, KU
	Knob	77709	Contrast - Models 21S355K, KU, 21S362K, KU, 21S367K, KU
	Knob	77718	Contrast - Models 21S357K, KU, 21S369K, KU
	Knob	79133	Tone- TV-Phono Switch - Models 21S355K, KU, 21S357K, KU
	Knob	77735	Tone- TV-Phono Switch - Models 21S362K, KU, 21S367K, KU
	Knob	77736	Tone- TV-Phono Switch - Models 21S369K, KU
	Knob	79223	Volume/on/off - For ebony instruments - Models 21S348K, KU
	Knob	79224	Volume/on/off - For maroon instruments - Models 21S348K, KU
	Knob	79231	Volume/on/off - Models 21S355K, KU, 21S362K, KU, 21S367K, KU
	Knob	79227	Volume/on/off-Models 21S357K, KU, 21S369K, KU
	Safety Glass	78329	Models 21S348K, KU
	Safety Glass	79322	Models 21S355K, KU, 21S357K, KU,
	Safety Glass	79285	Models 21S362K, KU, 21S367K, KU, 21S369K, KU

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

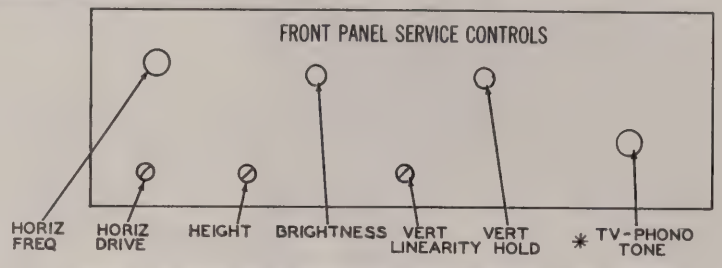
PICTURE TUBE SAFETY GLASS CLEANING

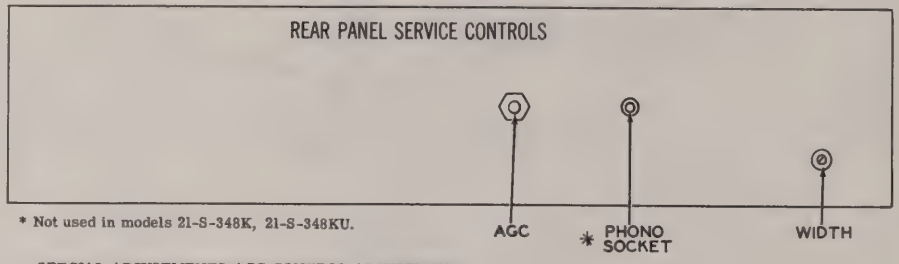
To clean safety glass remove rear cover, remove 4 spring clips from top safety glass molding. (Springs inside cabinet). Remove molding and glass. Use extreme caution. when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION





* Not used in models 21-S-348K, 21-S-348KU.

SPECIAL ADJUSTMENTS-AGC CONTROL ADJUSTMENT

Tune in the strongest TV station available. Switch off channel and back again if the picture does not appear immediately or bends excessively the AGC control (R6A) should be readjusted as follows:

Turn R6A maximum counter clockwise then clockwise until a very, very slight bend or change of bend occurs in the picture. Then turn R6A counter clockwise just enough to remove the bend or change of bend in the picture. In weak signal areas turn R6A clockwise until snow in the picture becomes more pronounced.

Turn R6A counter clockwise until best signal with minimum snow is obtained.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the front panel. Adjust the horizontal frequency slug until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L53) located on bottom of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

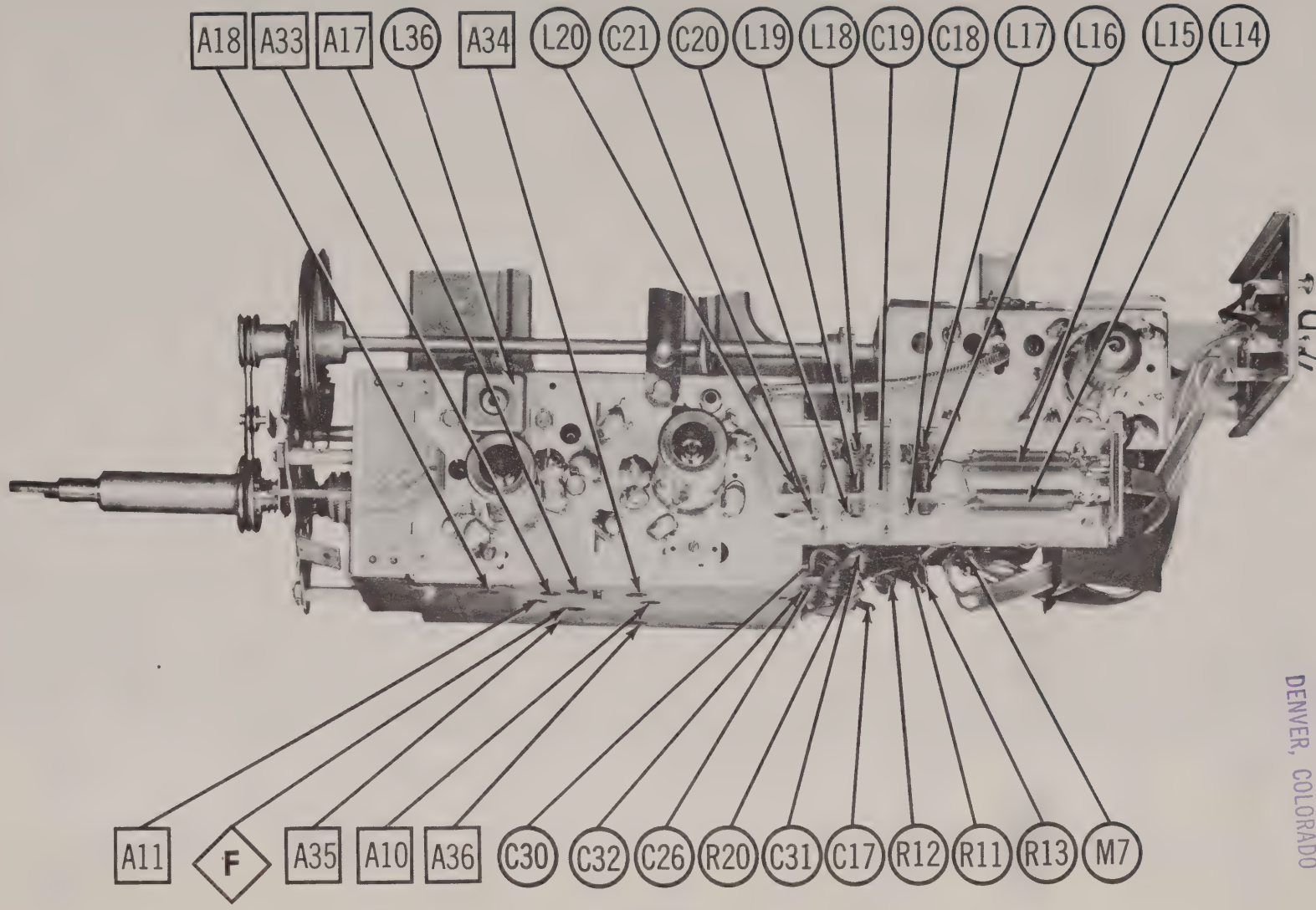
CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs, UHF and VHF dials, from front panel.
2. Remove 3 metal screws and 2 spring clips. Remove rear cover.
3. Disconnect speaker leads. Remove speaker, 4 nuts, remove speaker.
4. Disconnect picture tube socket, deflection yoke, H. V. lead, and dial light.
5. Remove 5 chassis bolts. Remove chassis.

TO REMOVE PICTURE TUBE REMOVE 2 NUTS FROM REAR TUBE BRACKETS AND 4 NUTS FROM FRONT BRACKETS.



UHF-VHF TUNER-TOP VIEW

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SILVERTONE
MODEL 4242 (Ch. 548.401-1)

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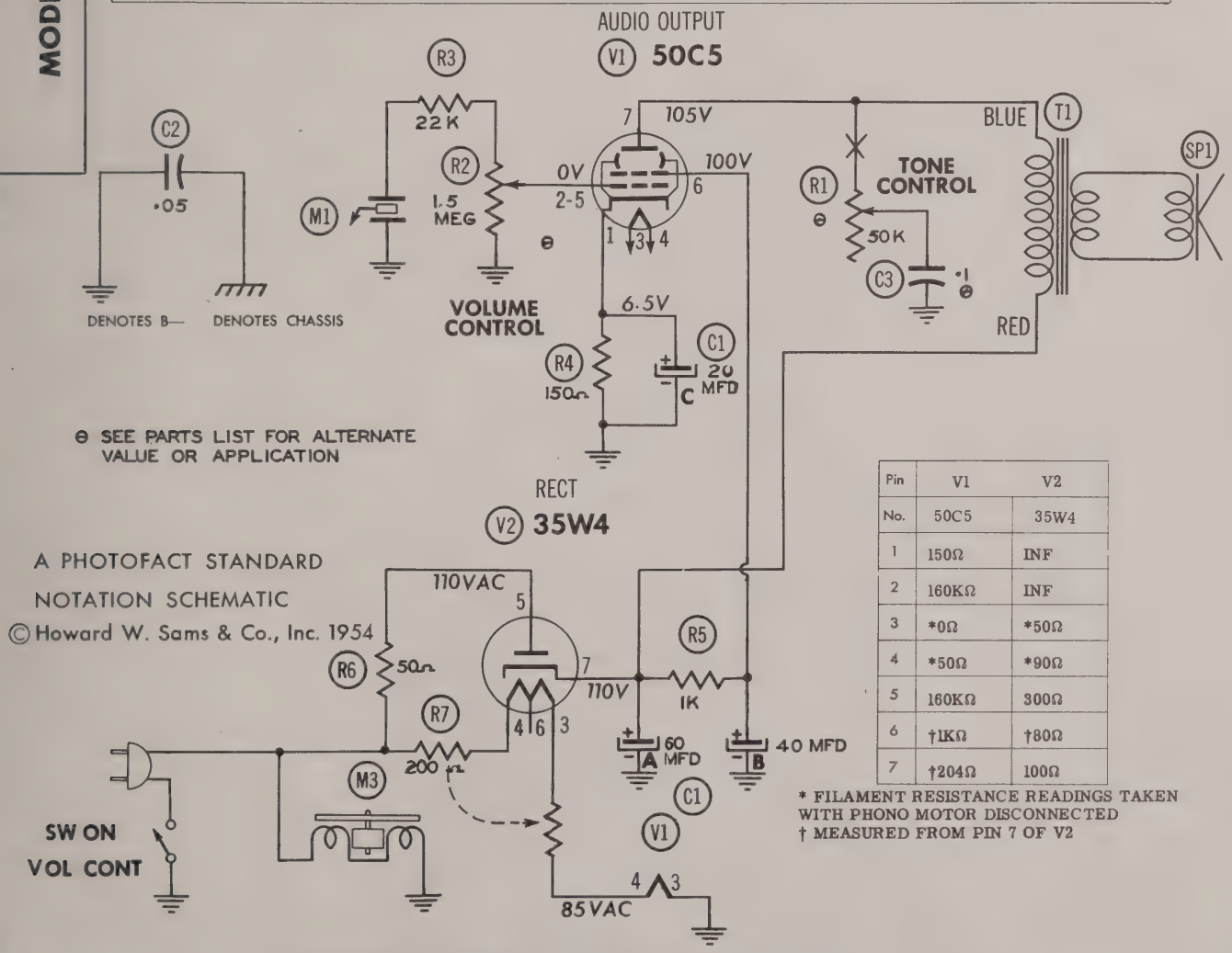
DENVER, COLORADO

SILVERTONE
MODEL 4242 (Ch. 548.401-1)

TRADE NAME	Silvertone Model 4242 (Ch. 548.401-1)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (Two)	Type 50C5 Audio Amplifier, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC



Pin No.	V1 50C5	V2 35W4
1	150Ω	INF
2	160KΩ	INF
3	*0Ω	*50Ω
4	*50Ω	*90Ω
5	160KΩ	300Ω
6	†1KΩ	†80Ω
7	†204Ω	100Ω

* FILAMENT RESISTANCE READINGS TAKEN WITH PHONO MOTOR DISCONNECTED
† MEASURED FROM PIN 7 OF V2

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Audio Amplifier	50C5	50C5	7CV	
V2	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	60	150		PRS1010D4A		BBRT5515C			TVA-3436	Red-Note2
B	40	150								Yellow
C	20	25								Blue
C2	.05	200	803	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.1		804							Note 1

Note 1. Not used in all models.
Note 2. Some models may use a 40/40/20 @ 150/25V.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	50KΩ	½						Tone-Note 1
R2A	1.5Meg		412	Q13-139	A47-500K-Z	AB-60		Volume-Note 2
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4		Attach to R2A
C	Switch		Not Req.	76-1	SWE-12	KB-1		Attach to R2A

Note 1. Not used in all models.
Note 2. Some models may use an alternate control Part No. 401.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	22KΩ	½	517	BTS-22K	
R4	150Ω	½	505	BTS-150	
R5	1000Ω	½	539	BTS-100	Note 1

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R6	50Ω	½			Note 1
R7	200Ω	10	623		

Note 1. Some models may use a 2200Ω resistor in this application.
Note 2. Some models may use a 30Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.5Ω		A-3332	A-3025	S-12X	Z1101	24S50 ①	① Drill one new mounting hole.

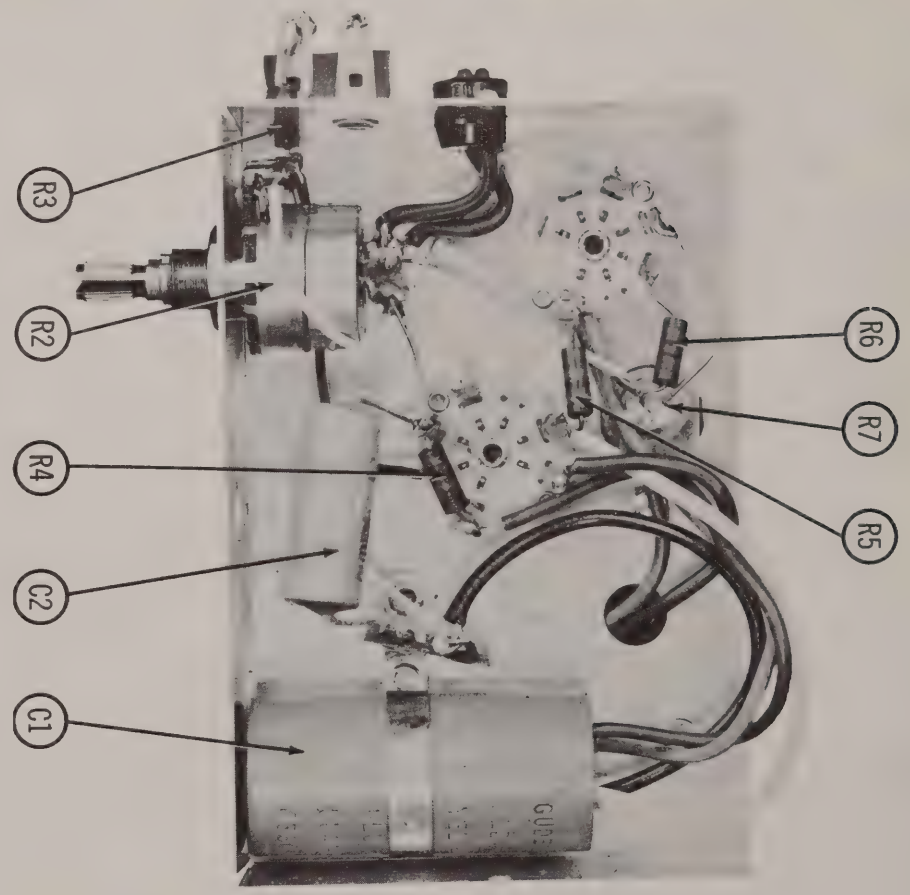
SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.5Ω	2611GC	4J6	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1		16LS *P-29				H60 *2400		*Complete tone arm & cartridge assembly

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2		*J-152 or *J-752	†B-450 or ♦B-450D	†WS-400-2	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Phono Motor	*2580	Alliance - 3 speed
M4	Carrying Case	2185	
M5	Handle	1732-2	(with pins)
M6	Knob	2421	

* Alternate phono motor part #2582.

PHOTOFACT* Folder

STEWART-WARNER MODELS 21C-9325F, G, 21C-9340E, K, KB, L, LB, M, MB, P, 21-T-9340A, B, D, R, RB, S, T

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MODEL 21C-9325F

STEWART-WARNER MODELS 21C-9325F, G, 21C-9340E, K, KB, L, LB, M, MB, P, 21-T-9340A, B, D, R, RB, S, T

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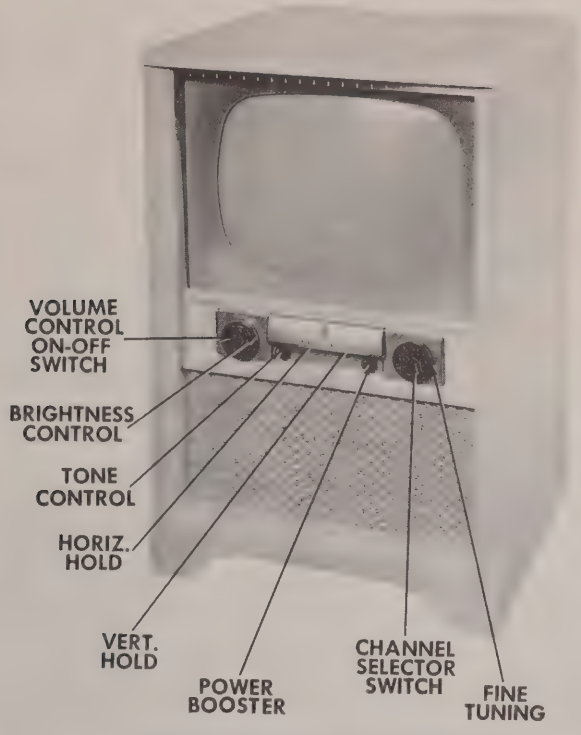

STEWART-WARNER MODEL 21C-9325F

TRADE NAME	Stewart-Warner	MODELS	SERIES
		21C-9325F, 21C-9325G	A thru D
		21C-9340E, 21C-9340K, 21C-9340KB, 21C-9340L, 21C-9340LB, 21C-9340M, 21C-9340MB, 21C-9340P	A thru N
		21T-9340A, 21T-9340B, 21T-9340D, 21T-9340R, 21T-9340RB, 21T-9340S, 21T-9340T	A thru N

MANUFACTURER	Stewart-Warner Electric, Div. of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.75 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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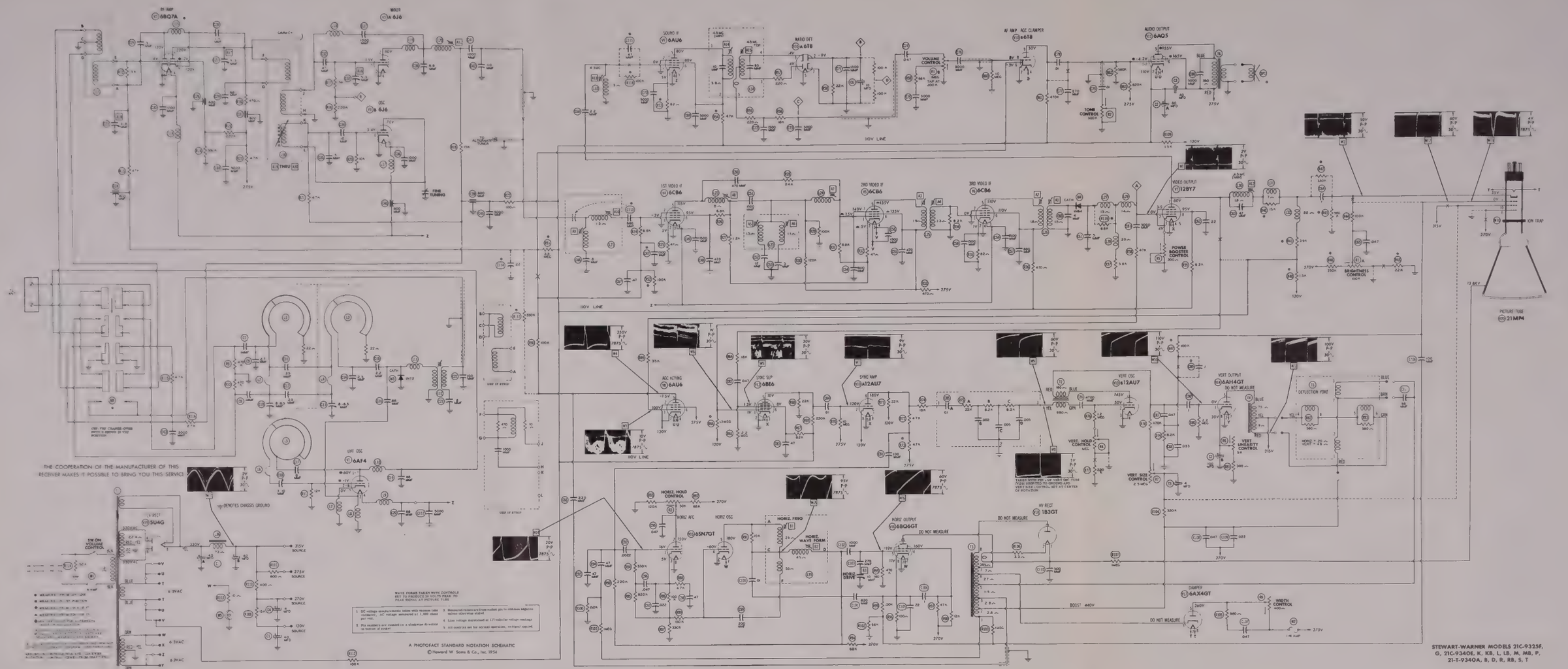
STEWART-WARNER MODELS 21C-9325F, G, 21C-9340E, K, KB, L, LB, M, MB, P, 21-T-9340A, B, D, R, RB, S, T


RF AMP V1 6BQ7A
MIXER V2 A 6J6
OSC V2 B 6J6
SOUND IF V9 6AU6
RATIO DET V10 A 6T8
AF AMP AGC CLAMPER V10 B 6T8
AUDIO OUTPUT V11 6AQ5
1ST VIDEO IF V4 6CB6
2ND VIDEO IF V5 6CB6
3RD VIDEO IF V6 6CB6
VIDEO OUTPUT V7 12BY7
AGC KEYING V8 6AU6
SYNC SEP V8 6BE6
SYNC AMP V13 A 12AU7
VERT OSC V13 B 12AU7
VERT OUTPUT V14 6AH4GT
HORIZ OSC V15 6SN7GT
HORIZ OUTPUT V16 6BQ6GT
HV RECT V18 1B3GT
DAMPER V17 6AX4GT
PICTURE TUBE V20 21MP4
UHF OSC V1 6AF4
V-HF RECT V19 5U4G
VOLUME CONTROL
TONE CONTROL
POWER BOOSTER CONTROL
BRIGHTNESS CONTROL
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
VERT. SIZE CONTROL
HORIZ. HOLD CONTROL
HORIZ. FREQ
HORIZ. WAVE FORM
HORIZ. DRIVE
WIDTH CONTROL
ION TRAP
DEFLECTION YOKE
FINE TUNING
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
110V LINE
BOOST 440V
DO NOT MEASURE
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CHASSIS TOP VIEW

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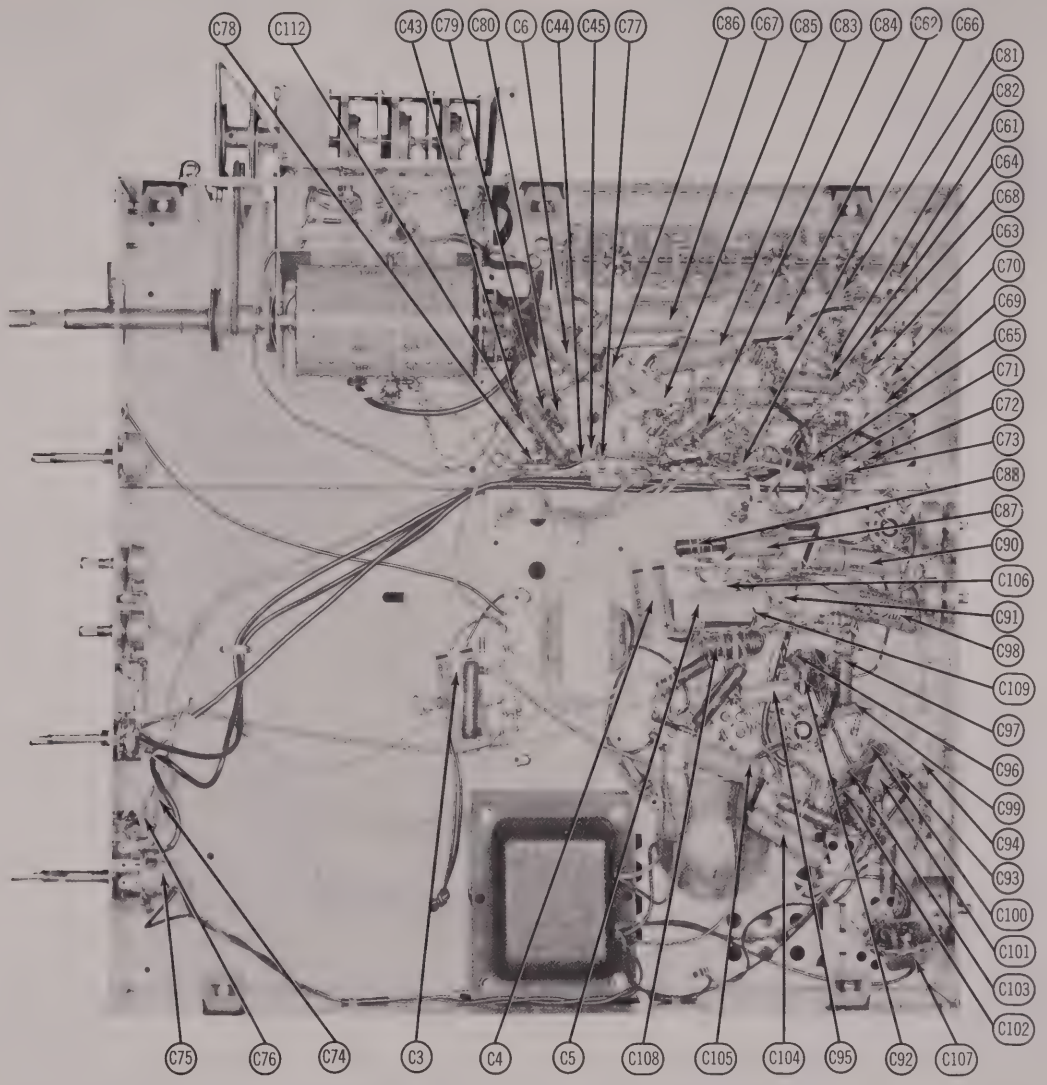

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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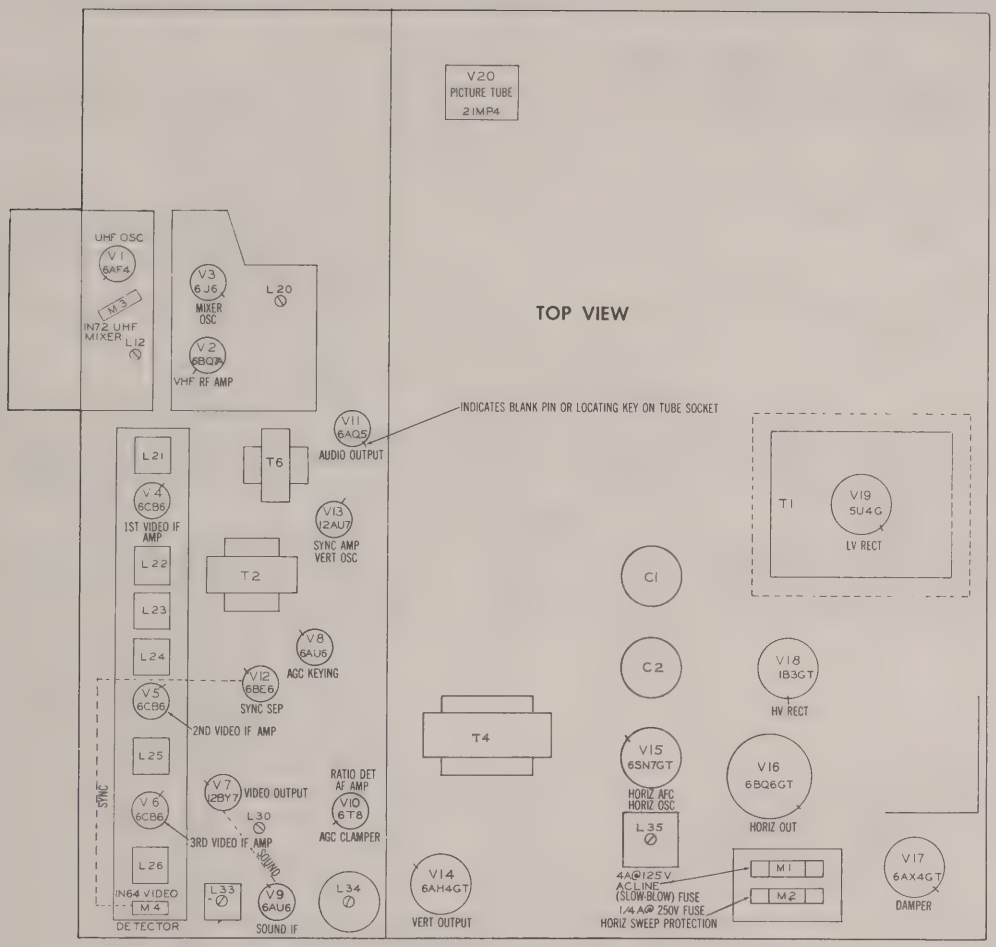

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19 Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V11, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V8, V20
Has pic, no sound - V9, V10, V11
Overloaded picture - V8, V10

SYNC FAILURE
No vert. sync - V13
No horiz. sync - V13, V15
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20, Fuse (M2)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V13
Horiz. off freq. - V13, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V15) to disable the high voltage. Connect a .001MFD capacitor across the vertical input terminals of oscilloscope.

VIDEO IF ALIGNMENT

The local oscillator should be disabled to reduce the possibility of erroneous indications. To do this remove the tuner bottom shield and place a strip of transparent cellulose tape across the first two contacts (from front) of an unused channel strip then switch the tuner to this insulated channel strip. Short the antenna terminals to chassis. Connect VTVM across the vertical input terminals of the oscilloscope.
Attenuate the sweep generator output to maintain not more than 1 volt at VTVM.
If a separate marker generator is used couple its output loosely to the sweep generator output cable. Set power booster control fully counter clockwise. Connect the synchronized sweep voltage from the sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 6CB6 (V6). Low side to chassis.	45MC (10MC Swp)	42MC 45MC	Channel with insulated channel strip	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. (Connect VTVM across scope vert. input).	A1, A2	Attach detuning clip (alligator clip) to pin 5 (plate) of V5. Adjust for maximum amplitude response curve similar to Fig. 1. Remove detuning clip.
2.	100MMF	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	"	42.0MC 43.5MC 44.9MC	"	"	V3, V4	Connect the negative lead of a 3 volt battery to the ungrounded side of C67. Connect the positive lead to chassis. Adjust for maximum amplitude response curve similar to Fig. 2.
3.	Direct	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	Not used	41.25MC (Unmod)	"	"	A5	Disconnect bias battery from C67. Adjust for MINIMUM deflection on VTVM.
4.	"	"	"	47.25MC	"	"	A6	"
5.	"	"	45MC (10MC Swp)	42.5MC 44.5MC	"	"	A7, A8	Reconnect bias battery as in step 2. Adjust for maximum amplitude response curve similar to Fig. 3.
6.	"	High side to an ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis.	Not used	39.75MC (Unmod)	"	"	A9	Disconnect bias battery from C67. Adjust for MINIMUM deflection on VTVM.
7.	"	"	45MC (10MC Swp)	42.5MC 44.5MC	"	"	A10, A11	Reconnect bias battery as in step 2. Adjust for maximum amplitude response curve similar to Fig. 4.
8.	"	"	"	39.75MC 41.25MC 45.75MC 47.25MC	"	"		Check for response curve similar to Fig. 5. If necessary, retouch A1 thru A4, A7, A8, A10 and A11 to obtain desired response. To check 39.75MC, 41.25MC and 47.25MC markers remove bias battery and use high scope gain and sweep generator output so that trap regions become visible on scope. If necessary, retouch A5, A6, and A9 to place markers in trap notches as in Fig. 5.

4.5MC TRAP ALIGNMENT

Remove V6 from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 6) to pin 11 of picture tube.	A12	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 10KΩ to point Ⓑ. Common to chassis.	A13, A14	Adjust for maximum deflection.
11.	"	"	"	"	DC probe thru 10KΩ to point Ⓒ. Common to point Ⓓ.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.	A13, A14	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 7.
11.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A15	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 8. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

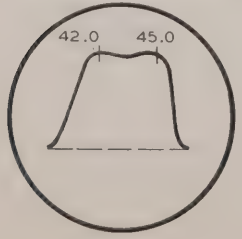

FIG. 1

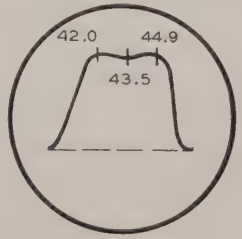

FIG. 2

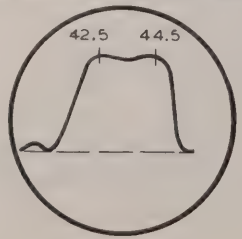

FIG. 3

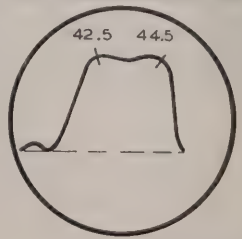

FIG. 4

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ALIGNMENT INSTRUCTIONS (cont)

VHF RF ALIGNMENT FOR TUNER USED IN MODELS 21C-9325F, G

Remove the cellulose tape from the tuner channel strip. Leave the bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (E). Low side to tuner chassis.	A16, A17 A18	Adjust for response curve similar to Fig. 9 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustment of A16, A17 and A18 with channel selector set to that channel, then check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF OSCILLATOR ALIGNMENT FOR TUNER USED IN MODELS 21C -9325F, G

The oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Leave bias battery connected as under Video IF Alignment.
Connect a .001MFD capacitor across the vertical input terminals of oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (A). Low side to chassis (Connect VTVM across scope vert. input).	A19	Attenuate sweep generator output to maintain not more than 1 volt at VTVM. Adjust to place sound marker in trap notch as in Fig. 10. Video marker should be at 50%.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A20	
			207MC (10MC Swp)	205.25MC 209.75MC	12		A21	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A22	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A23	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A24	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A25	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A26	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A27	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A28	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A29	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A30	

VHF RF ALIGNMENT FOR TUNER USED IN MODELS 21C-9340K, KB, L, LB, M, MB, P, 21T-9340A, R, RB, S, T

Follow same alignment procedure as outlined under "VHF RF Alignment" for tuner used in Models 21C-9325F, G."

VHF OSCILLATOR ALIGNMENT FOR TUNER USED IN MODELS 21C-9340K, KB, L, LB, M, MB, P, 21T-9340A, R, RB, S, T

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A31.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A31 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
Follow the same alignment procedure as outlined under "VHF Oscillator Alignment for tuner used in Models 21C-9325F, G".

UHF TUNER ALIGNMENT

The UHF portion of the receiver has been properly aligned at the factory and is very stable. If the UHF tuner is known to be out of alignment or is in need of major repair the entire unit including the tube should be returned to the factory service department.

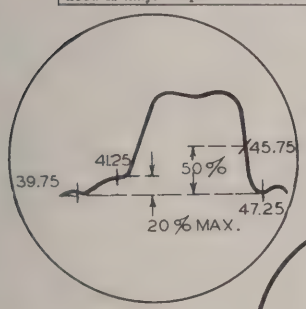


FIG. 5

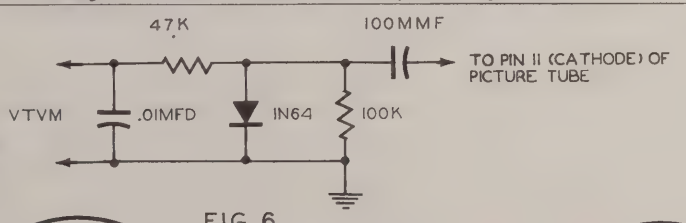


FIG. 6

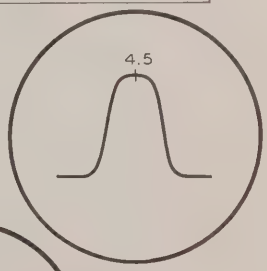


FIG. 7

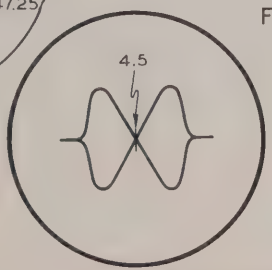


FIG. 8

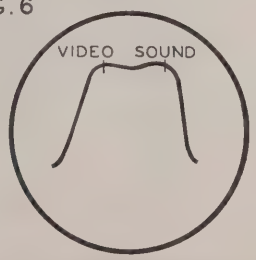


FIG. 9

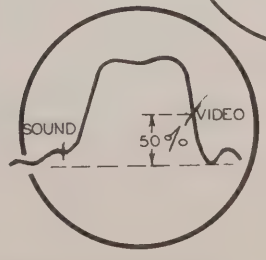
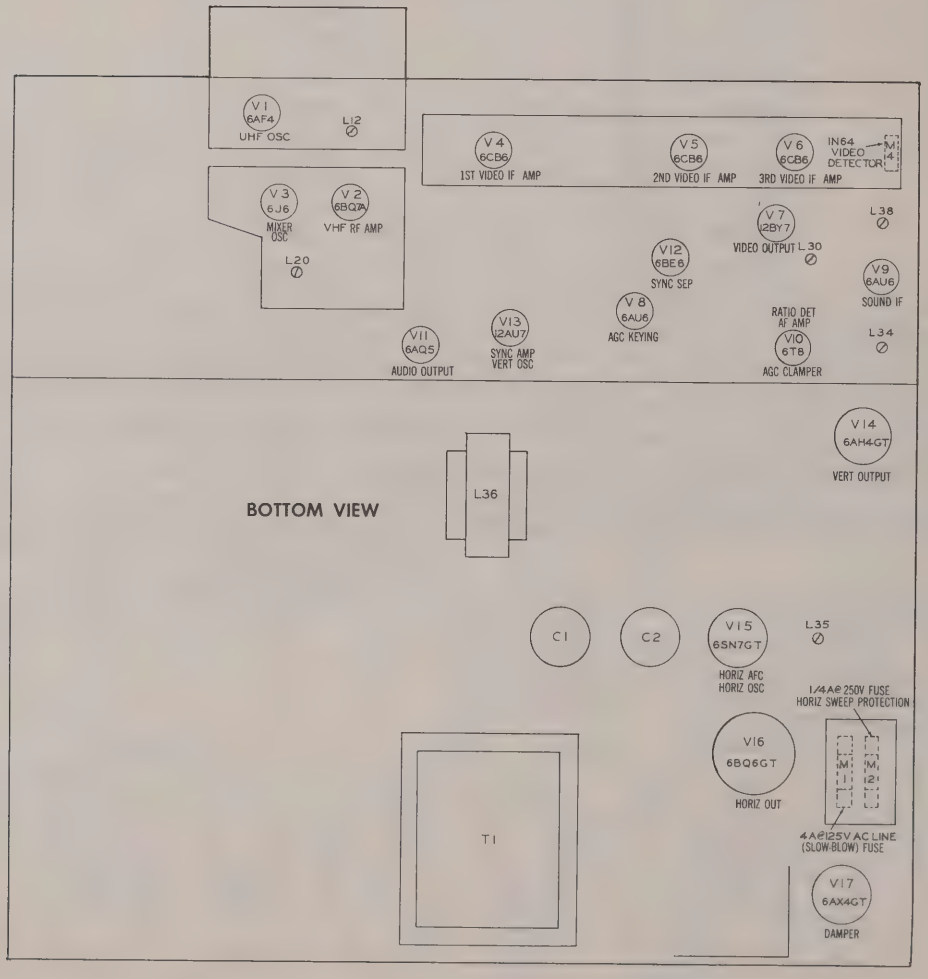


FIG. 10

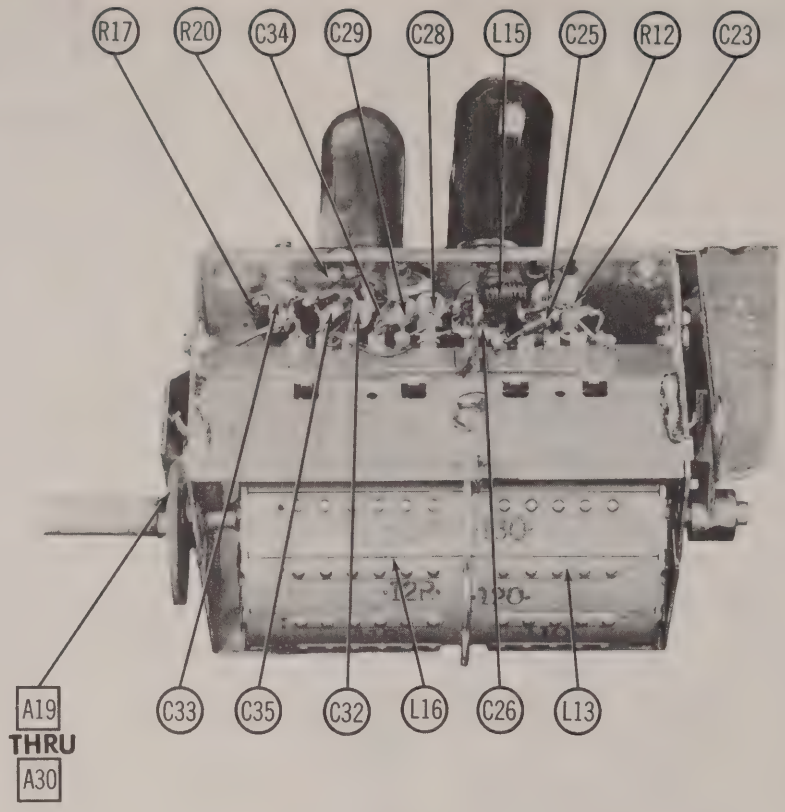
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	¶■2. 8KΩ	12KΩ	0Ω	. 1Ω	0Ω	12KΩ	¶■2. 8KΩ		
V 2	6BQ7A	INF.	100KΩ	0Ω	. 1Ω	0Ω	† 5. 8KΩ	160KΩ	INF.	0Ω
V 3	6J6	¶ 4. 8KΩ	¶ 15KΩ	. 1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 4	6CB6	100KΩ	47Ω	0Ω	. 1Ω	♦L. 2KΩ	♦ 8KΩ	0Ω		
V 5	6CB6	♦6. 8KΩ	♦ 47Ω	¶ 100KΩ	¶ 100KΩ	† 1. 2KΩ	† 1. 2KΩ	100KΩ		
V 6	6CB6	1. 3Ω	82Ω	. 1Ω	0Ω	¶ 470Ω	¶ . 470Ω	0Ω		
V 7	12BY7	25Ω	5. 6KΩ	25Ω	. 1Ω	. 1Ω	0Ω	†15. 4KΩ	¶ 8. 2KΩ	25Ω
V 8	6AU6	† 50. 5KΩ	† 15KΩ	¶ 100KΩ	¶ 100KΩ	200KΩ	† 700Ω	† 15KΩ		
V 9	6AU6	1. 3Ω	0Ω	. 1Ω	0Ω	¶ 4. 7KΩ	¶ 4. 7KΩ	82Ω		
V 10	6T8	INF.	22KΩ	INF.	.1Ω	0Ω	100KΩ	0Ω	10Meg	¶ 470KΩ
V 11	6AQ5	400KΩ	† 12KΩ	¶ 100KΩ	¶ 100KΩ	† 1KΩ	† 700Ω	400KΩ		
V 12	6BE6	† 1. 5Meg	0Ω	. 1Ω	0Ω	¶ 40KΩ	¶ 82KΩ	2. 2Meg		
V 13	12AU7	▲ 2. 5Meg	2. 5Meg	0Ω	0Ω	0Ω	† 32KΩ	† 10Meg	† 10 KΩ	. 1Ω
V 14	6AH4GT	2. 2Meg	0Ω	† 12KΩ	2. 2Meg	† 820Ω	† 12KΩ	. 1Ω	2KΩ	
V 15	6SN7GT	1. 5Meg	† 80KΩ	430KΩ	480KΩ	† 68. 5KΩ	0Ω	. 1Ω	0Ω	
V 16	6BQ6GT	† 450Ω	. 1Ω	INF.	10KΩ	470KΩ	† 68. 5KΩ	0Ω	100Ω	TOP CAP ▲ 17Ω
V 17	6AX4GT	INF	† 1. 2KΩ	500KΩ	† 68. 5KΩ	† 550Ω	† 68. 5KΩ	† 12KΩ	† 12KΩ	
V 18	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 412Ω
V 19	5U4G	INF.	20KΩ	INF.	21Ω	INF.	22Ω	INF.	20KΩ	
V 20	21MP4	¶ 100KΩ	108KΩ	PIN 6 † 450Ω	PIN 10 † 70Ω	PIN 11 † 200KΩ	PIN 12 ¶ 100KΩ			

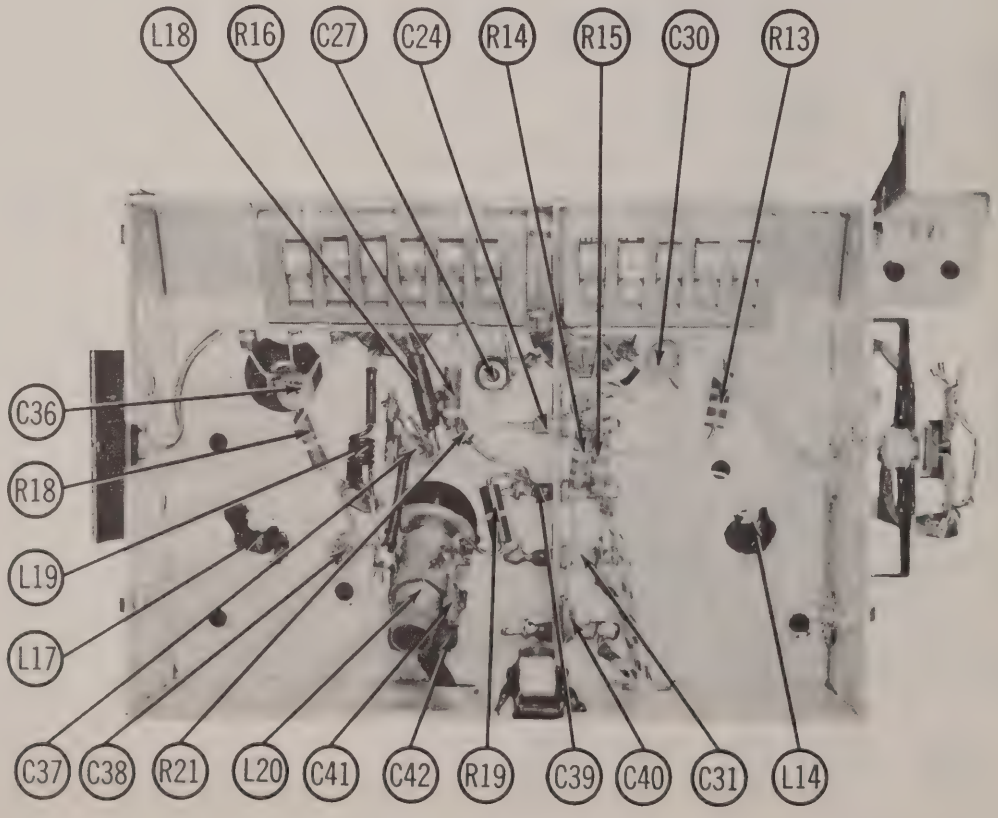
† MEASURED FROM PIN 8 OF V19.
■ MEASURED IN UHF POSITION.
♦ MEASURED FROM PIN 7 OF V5.
▲ MEASURED FROM PIN 3 OF V17.
¶ MEASURED FROM 110V LINE.



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

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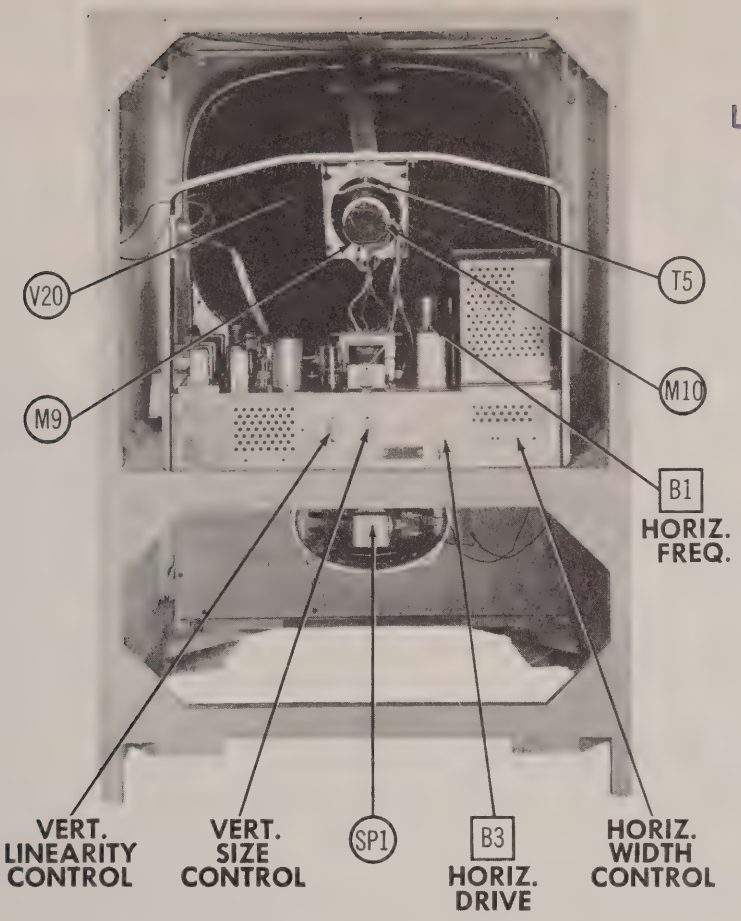

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Set the horizontal hold control to its fully clockwise position.
2. Turn the horizontal frequency slug (B1) and the horizontal waveform slug (B2) fully counter clockwise.
3. Connect a short jumper from terminal "C" to terminal "D" of L35.
4. Set the horizontal drive trimmer (B3) one half turn from its fully clockwise position.
5. Adjust B1 clockwise until picture falls into sync.
6. Remove jumper from L35 and adjust B2 clockwise until picture again falls into sync.
7. Connect the high side of vertical amplifier input of scope thru 10MMF to terminal "C" of L35. Connect low side to chassis. Adjust B2 for waveform similar to Fig.11. If necessary keep the picture in sync while adjusting B2 by turning the horizontal hold control counter clockwise. Remove scope from L35.
8. Turn the horizontal hold control counter clockwise and adjust B1 until picture locks in horizontally and does not lose sync when switching off channel and back again. Then turn B1 slowly counter clockwise until picture is just ready to lose sync.
9. Horizontal holding action should be as follows:
   (a) With horizontal hold control fully counter clockwise switch off channel and back again. Picture may be just out of sync.
   (b) With horizontal hold control fully clockwise picture may lose sync when switching off channel and back again.
   (c) With horizontal hold control at or near its mid-range position, picture should remain in sync when switching off channel and back again.

Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the horizontal width control for a picture slightly wider than necessary to fill the picture mask horizontally.

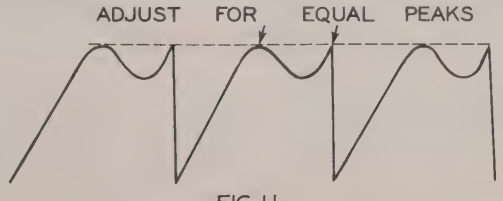

FIG. 11

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17 and V19. Check T3, T5A, R97, R98 and C102. Check B3 and R8. Check other associated components.

DRIVE LINES

Check by substitution V16 and V17. Adjust B3. Check R96, R97, R98, C102, C105 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V16 and V17. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V15, V16 and V17. Check C93 for open. Check T3, T5A and other associated components.

XMAS TREE EFFECT

Check by substitution V15, V16 and V17. Check T3 and T5A for internal arcing. Check L35, C100, C99, R91, R92, R93, R94 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V13 and V14. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R6, R81 and other associated components.	Check C90, T2, R78, R7, and other associated components.

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check vertical size and vertical linearity controls for proper operation. Check T4 and T5B.

COMPRESSED AT BOTTOM

Check by substitution V13 and V14. Check R7, R78, T2, C90 and other associated components.

COMPRESSED AT TOP

Check by substitution V13 and V14. Check R81, R6, C2B and other associated components.

FOLDS

Check by substitution V13 and V14. Check C87, R79, R81 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V12 and V13. Check C82, C84, R64, R69, R71 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V12 and V13. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check C86, R76, R77, R4 and other associated components.	Check vertical integrator for component failure or change of value. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC- VERTICAL SYNC SATISFACTORY

Check by substitution V15. Check C91, C92, C95, R92 and other associated components.

HORIZONTAL BENDING

Check by substitution V8, V12, V13 and V15. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check L30, L31, C64, R42, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A12. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check L31, R42, C64, contrast control, picture tube and other associated with V7. Check video IF alignment.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check video crystal detector network. Check AGC network.

SMEAR

Substitute V7. Check L28, L27, L31, L32, C64, R42 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V9 and V11. Check stages V9 and V11 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C78, C80, C77, R61, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A15 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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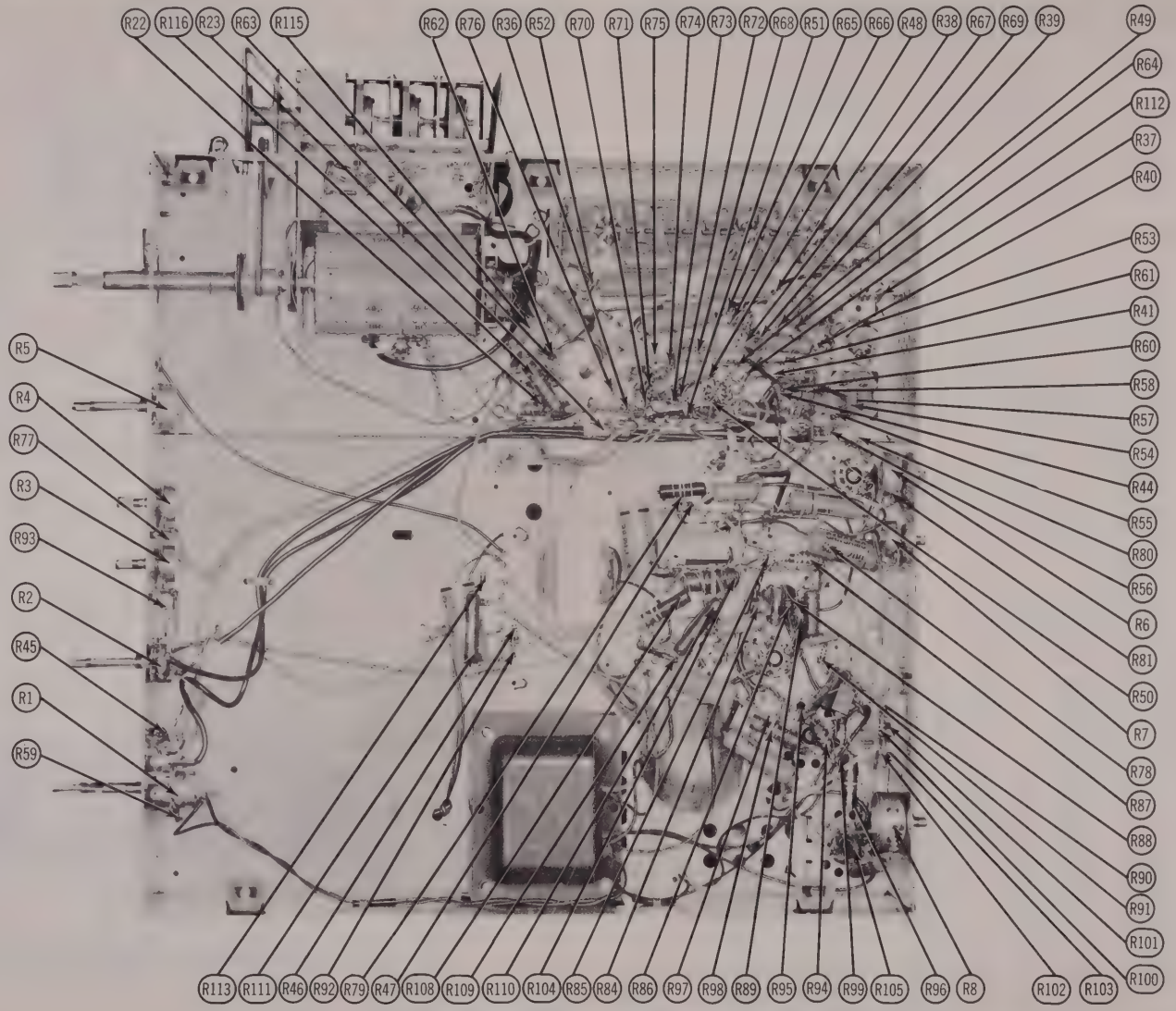
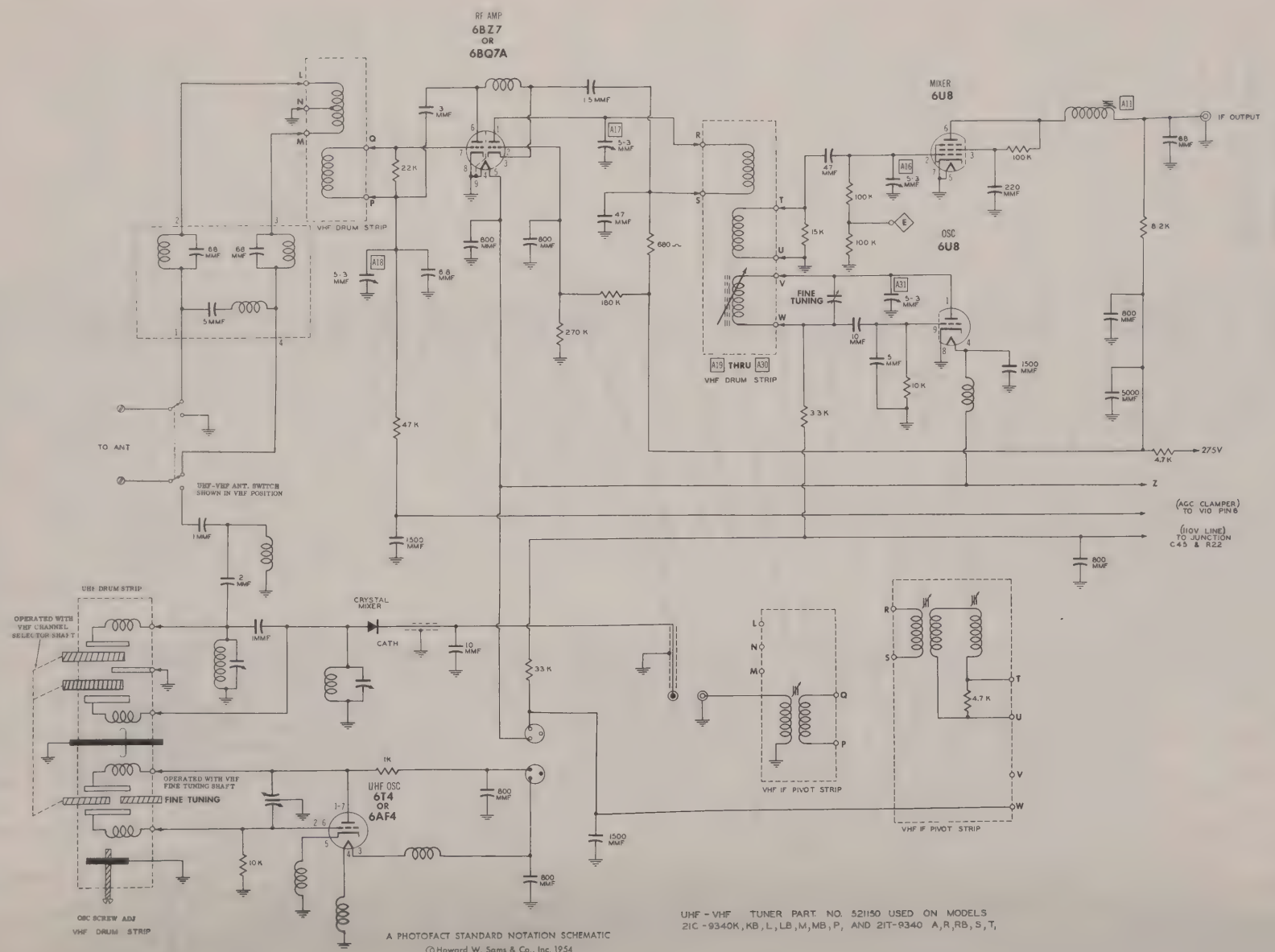


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF - VHF TUNER PART NO. 521150 USED ON MODELS 21C-9340K, KB, L, LB, M, MB, P, AND 21T-9340 A, R, RB, S, T.

ALTERNATE TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart-Warner PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BQ7A	6BQ7A	9AJ	6BQ7 or 6BZ7 used in some sets
V3	Mixer - Osc.	6J6	6J6	7BF	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amp. -AGC Clamper	6T8	6T8	9E	
V11	Audio Output	6AQ5	6AQ5	7BZ	
V12	Sync Separator	6BE6	6BE6	7CH	
V13	Sync Amplifier-Vert. Osc.	12AU7	12AU7	9A	
V14	Vert. Output	6AH4GT	6AH4GT	8EL	
V15	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6AX4GT	6AX4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	Stewart-Warner PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V20	21MP4	21MP4	21MP4	21MP4	21MP4	12M	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450	508072	AFH3-44		C035		FP377	TVL-3787	
B	▲40	450								
C	■40	450								
C2A	▲80	250	509002	AFH3-142		B087		FP229.8	TVL-3722	
B	▲100	50								
C3	40	300	160095	PRS450/40		BR4035		TC78	TVA-1611	
C4	4	450	504719	PRS450/4		BR445		TC70	TVA-1702	
C5	4	450	504719	PRS450/4		BR445		TC70	TVA-1702	
C6	10	150	505174	PRS150/12		BR1015		TC42	TVA-1406	
C7	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C8	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C9	2.7									
C10	.8-6.5									
C11	.25									
C12	.25									
C13	.8-6.5									
C14	2.5									
C15	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C16	.68									
C17	6									
C18	3-10									
C19	68			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C20	68			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C21	8									
C22	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C23	3-9		509064		829-10					
C24	800			EF-001	MFT-1000				503C-D1	
C25	3		513453	SI3NP0	TCZ-3.3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C26	800			EF-001	MFT-1000				503C-D1	
C27	.5-3		509063		829-3		3115-01-0R5	CT565A		
C28	1.5		513033	SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C29	68		513040	BPD-000068	D6-680	G038	801-680	UC-5468	5GA-Q68	
C30	1000		513041	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	800			EF-001	MFT-1000				503C-D1	
C32	47		520719	BPD-000047	D6-470	G033	801-470	UC-5447	5GA-T47	
C33	.5-3		509063		829-3		3115-01-0R5	CT565A		
C34	10		513437	SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C35	5		513450							
C36	1000		513041	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	1000		513041	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	6.8		513451	SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C39	800			EF-001	MFT-1000				503C-D1	
C40	800			EF-001	MFT-1000				503C-D1	
C41	1000		513009	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	110		513452							
C43	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C44	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C45	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	8		513455							
C47	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	Note 1
C48	470		513037	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C49	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C50	470		513037	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C51	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C52	12		513448							
C53	5		513449							
C54	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C55	470		513037	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C56	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C57	680		513044	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C58	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C59	1500		513038	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C60	4		513454			Z009				
C61	5		513432	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C62	.22	800	512238	P288-22		CUB2P22		PT4022	2TM-P22	
C63	47		513438	SI47NP0	TCZ-47	TZ22	NP0K-470	ZT-5447	5TCC-Q47	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORA

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C64	.1	200	512316	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C65	.047	200	512335	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C66	220	1000	512332	HVD15-220	DD30-221	VY23	IR5KV-221	MCK323	10GA-T23	
C67	.47	200	512329	P288-47		CUB2P47		PT4047	2TM-P47	
C68	2.2		513001	SI2.2NP0	TC2-2.2	TZ05	NP0K-1R2		5TCCB-V22	
C69	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C70	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C71	1500		513010	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C72	1500		513010	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C73	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C74	.047	200	512335	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C75	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C76	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C77	270		513006	SI270	D6-271	TP41	GP3K-271	UC-5327	5GA-T27	
C78	.01	400	512205	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C79	.01	200	512204	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C80	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C81	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C82	.047	200	512335	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C83	.47	200	512329	P288-47		CUB2P47		PT4047	2TM-P47	
C84	.01	400	512205	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C85A	.01							PT611		
B	.002		⑥5080063	⑥BPD-01	⑥DD-103	⑥K062	⑥811-01	PT622	⑥5HK-S1	
C	.005			PA-110	PC-100	115TM1	1405-01	PT625	V-1	
D	.005							PT625		
C86	4700	1000	512533							
C87	.047	400	512236	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C88	.033	200	512210	P488-033		PM4S33		PT4133		
C89	.1	200	512218	P288-1	DF-104	CUB2P1		PT401	2TM-P1	Note 2
C90	.1	600	512218	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C91	100	500	512502	1469-0001		32R5T1		MCB235	MS-31	
C92	.0022	600	512232	P688-0022	D6-222	CUB6D22	GP2-333-222	CUB6D22	5TM-D22	
C93	47	1000	513030	HVD15-47	DD30-470	VQ47	IR5KV-470	MCL447	10GA-Q47	
C94	47	1000	513030	HVD15-47	DD30-470	VQ47	IR5KV-470	MCL447	10GA-Q47	
C95	.047	600	512236	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C96	.047	200	512335	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C97	.022	400	512233	P488-022	DF-303	CUB4S22	817-02	PT4122	4TM-S22	
C98	.47	200	512329	P288-47		CUB2P47		PT4047	2TM-P47	
C99	200		513427							
C100	.01	200	512331							
C101	820	500	512547			5R5T82				
C102	1000		513009	SI1000	D6-102	TP53	GP2L-102	UC-521	5HK-D1	
C103	270		513006	SI270	D6-271	TP41	GP3K-271	UC-5327	5GA-T27	
C104	.1	600	512218	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C105	.22	200	512238	P288-23		CUB2P23		PT4023	2TM-P22	
C106	100	500	512502	1469-0001		32R5T1		MCB235	MS-31	
C107	.047	200	512335	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C108	.047	600	512237	P688-047		CUB6S47		PT6147	6TM-S47	
C109	.022	600	512234	P688-022		CUB6S22		PT6122	6TM-S22	
C110	500	20000	520990	HV20C	TV3-503	M5W20T5	413	HV20035A	20DK-T5	
C111	56	1500	513027		DD30-560		3KV-560		30GA-Q56	
C112	5000		513013	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C113	680		513044	SI680	D6-681	TP50	GP3K-681	UC-5368	5GA-T68	Note 3
C114	.22	200	512238	P288-23		CUB2P23		PT4023	2TM-P23	Note 4
C115	.47		513002	SI47NP0	TCZ-47	T222	NP0K-470	Z7-5447	5TCC-Q47	Note 5

Note 1. Value changed to 5000MMF in Models 21C-9340 and 21T-9340.
Note 2. Not used in all versions.
Note 3. C113 used only in models 21C-9325F and 21C-9325G with letter "C" includes in series designation.
Models 21C-9340 and 21T-9340 without series designation use 82MMF with letter "A" included in series designation use 470MMF, with letter "C" included in series designation use 680MMF.
Note 4. C114 used only in Models 21C-9340 and 21T-9340 with Letter "N" included in series designation.
Note 5. C115 used only in models 21C-9340 and 21T-9340 with letter "H" included in series designation.
* Items C85A, C85B, C85C, C85D, R75A, R75B, R75C are combined in one unit.
* To replace mfgr's original unit, install 10000MMF unit in series with C-R unit input lead.

CONTROLS

ITEM No	RATING RESIST-ANCE	RATING WATTS	Stewart-Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ		521080	* QJ-471	RTV-426	F1-31	UF15L	Brightness-Panel
B	1 Meg					R2-57	UR16T25 †	Volume tapped ② 200K-Rear
C	Switch					KB-1	US-26	Attach to R1B
R2A	500KΩ		520748	Q11-133	A47-500K-S	AB-39	U-30	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ		521059	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	1 Meg		521058	Q11-137	A47-1Meg-S	AB-89	U-34	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	500Ω		521057	Q11-103	A47-500K-S	AB-4	R500L	Power Booster
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	D6-38	Attach to R5A
R6A	5000Ω		520945	Q17-114	A47-5000-S	AB-12	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2.5Meg		520944	Q11-239	A47-2.5Meg	AB-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	-S			
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	400Ω	4	520998	4WK-400	A10-400	SVP-991	M400PK	Width-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT KIT K-3 BASE ELEMENTS & SHAFTS B11-128 & P1-123 (Panel)
B13-137X & R1-216 (Rear) & SWITCH 76-L
† Universal replacement (Mallory exact duplicate Part No. UE1240S).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Stewart-Warner PART No.	IRC PART No.	NOTES
R9	470KΩ	½		BTS-470K	
R10	470KΩ	½		BTS-470K	
R11	12KΩ	½		BTS-12K	
R12	15KΩ	½		BTS-15K	
R13	47KΩ	½		BTS-47K	
R14	330KΩ	½		BTS-330K	
R15	220KΩ	½		BTS-220K	
R16	470Ω	½		BTS-470U	
R17	15KΩ	½		BTS-15K	

ITEM No.	RATING OHMS	RATING WATT	Stewart-Warner PART No.	IRC PART No.	NOTES
R18	220KΩ	½		BTS-220K	
R19	15KΩ	½		BTS-15K	
R20	10KΩ	½		BTS-10K	
R21	4700Ω	½		BTS-4700	
R22	100Ω	½	510118	BTS-100	
R23	4700Ω	½	510348	BTA-4700	
R24	6800Ω	½	510151	BTS-6800	
R25	47Ω	½	510112	BTS-47	
R26	6800Ω	½	510151	BTS-6800	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Stewart-Warner PART No.	IRC PART No.	NOTES
R27	1200Ω	½	510138	BTS-1200	
R28	24KΩ 5%	½	510783	BTS-24K 5%	
R29	100KΩ	½	510172	BTS-100K	
R30	120KΩ	½	510174	BTS-120K	
R31	6800Ω	½	510151	BTS-6800	
R32	47Ω	½	510112	BTS-47	
R33	470Ω	½	510130	BTS-470	
R34	8200Ω	½	510153	BTS-8200	
R35	82Ω	½	510117	BTS-82	
R36	470Ω	½	510130	BTS-470	
R37	5600Ω	½	510150	BTS-5600	
R38	47KΩ	½	510168	BTS-47K	
R39	8200KΩ	½	510153	BTS-8200	
R40	15KΩ	½	510744	BTS-15K	Note 1
R41	3900Ω	½	510247		Note 2
R42	330KΩ	½	510181	BTS-330K	Note 3
R43	560KΩ	½	510186	BTS-560K	Note 3
R44	100KΩ	½	510172	BTS-100K	
R45	22KΩ	½		BTS-22K	Note 5
R46	330KΩ	½	510181	BTS-330K	Note 4
R47	100KΩ	½		BTS-100K	Note 6
R48	1500Ω	½	510139	BTS-1500	Note 7
R49	33KΩ	½	510183	BTS-33K	
R50	100KΩ	½	510177	BTS-100K	
R51	3.3Meg	½	510701	BTS-3.3Meg	Note 16
R52	100KΩ	½	510172	BTS-100K	Note 9
R53	82Ω	½	510117	BTS-82	Note 13
R54	4700Ω	½	510349	BTA-4700	Note 12
R55	220Ω	½	510124	BTS-220	
R56	18KΩ	½	510159	BTS-18K	
R57	220Ω	½	510124	BTS-220	
R58	22KΩ	½	510160	BTS-22K	
R59	68KΩ	½	510169	BTS-68K	
R60	10 Meg	½	510707	BTS-10 Meg	
R61	470KΩ	½	510184	BTS-470K	
R62	560KΩ 5%	½	510779	BTS-560K 5%	
R63	820KΩ 5%	½	510747	BTS-820K 5%	
R64	18KΩ	½	510159	BTS-18K	
R65	2.2Meg	½	510183	BTS-2.2Meg	
R66	1.5Meg 5%	½	510753	BTS-1.5Meg 5%	Note 15
R67	82KΩ	½	510171	BTS-82K	
R68	22KΩ	½	510160	BTS-22K	
R69	220KΩ	½	510178	BTS-220K	
R70	10 Meg	½	510707	BTS-10 Meg	
R71	22KΩ	½	510160	BTS-22K	
R72	4700Ω	½	510148	BTS-4700	
R73	4700Ω	½	510148	BTS-4700	Note 8
R74	18KΩ	½	510159	BTS-18K	

ITEM No.	RATING OHMS	RATING WATT	Stewart-Warner PART No.	IRC PART No.	NOTES
R75A	22KΩ	½		BTS-22K	
B	8200Ω	½	⑥5080621	BTS-8200	
C	8200Ω	½		BTS-8200	
R76	1.2Meg 5%	½	510777	BTS-1.2Meg 5%	
R77	220KΩ	½	510178	BTS-220K	
R78	470KΩ	½	510184	BTS-470K	
R79	8200Ω	½	510153	BTS-8200	
R80	2.2Meg	½	510183	BTS-2.2Meg	
R81	390Ω	½	510129	BTS-390	
R82	560Ω	½	510132	BTS-560	
R83	560Ω	½	510132	BTS-560	
R84	330KΩ	½	510181	BTS-330K	
R85	820KΩ	½	510189	BTS-820K	
R86	100KΩ	½	510172	BTS-100K	
R87	330KΩ	1	510281	BTA-330K	
R88	4700Ω	½	510148	BTS-4700	
R89	150KΩ	½	510175	BTS-150K	
R90	220KΩ	½	510178	BTS-220K	
R91	10KΩ	½	510154	BTS-10K	
R92	68KΩ	½	510169	BTS-68K	
R93	120KΩ	½	510174	BTS-120K	
R94	68KΩ	½	510269	BTS-68K	
R95	470KΩ	½	510184	BTS-470K	
R96	100Ω	2	510318		
R97	47KΩ	½	510166	BTS-47K	
R98	12KΩ	3	510356	BTB-12K	
R99	150KΩ	3	510175	BTB-150K	
R100	150KΩ	½	510175	BTS-150K	
R101	1 Meg	½	510190	BTS-1 Meg	
R102	680KΩ	½	510180	BTS-560K	
R103	1 Meg	½	510190	BTS-1 Meg	
R104	330KΩ	½	510181	BTS-330K	
R105	100Ω	2	510134	BTS-680	
R106	3.3Ω	1	510725		
R107	1 Meg	1	510190	BTA-1 Meg	
R108	150KΩ	2	510357	BTB-15K	
R109	1500Ω	½	510139	BTS-1500	
R110	400Ω	10	510779	1 3/4A-400	
R111	800Ω	10	510741	1 3/4A-800	
R112	100KΩ	½	510172	BTS-100K	
R113	10Ω	½	510101	BTS-10	
R114	150KΩ	½	510175	BTS-150K	
R115	4700Ω	2	510348	BTB-4700	
R116	2700Ω	2	510344	BTB-2700	
R117	330KΩ	½		BTS-330K	Note 11
R118	100KΩ	½		BTS-100K	Note 14
R119	6800Ω	½		BTS-6800	Note 5

Note 1. Some models may use a 12KΩ resistor in this application.
Note 2. Some models may use a 2200Ω resistor in this application.
Note 3. Not used in all versions.
Note 4. Some models may use a 220KΩ resistor in this application.
Note 5. Used only in Models 21C-9325F & 21C-9325G with the letter "G" included in series designation.
Note 6. Some models may use a 47KΩ resistor in this application.
Note 7. Some models may use a 1800Ω resistor in this application.
Note 8. Some models may use a 6800Ω resistor in this application.
Note 9. Value changed to 220KΩ when used in Models 21C-9340 & 21T-9340 with the Letter "N" included in series designation.
Note 10. Value changed to 10Meg when used in Models 21C-9340 & 21T-9340 with the letter "N" included in series designation.
Note 11. Used only in Models 21C-9340 & 21T-9340 with the Letter "N" included in series designation.
Note 12. Value changed to 1000Ω when used in Models 21C-9340 & 21T-9340 with the Letter "N" included in series designation.
Note 13. Value changed to 120Ω when used in Model 21C-9340 & 21T-9340 with the Letter "H" included in series designation.
Note 14. Used only in Models 21C-9340 & 21T-9340 when the letter "N" is included in series designation.
Note 15. Some models may use a 2.7Meg resistor in this application.
* Items R75A, R75B, R75C, C85A, C85B, C85C, C85D are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI	RATING SEC. 1	RATING SEC. 2	Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC ② 1.75A	660VCT ② 170ADC	5VAC ② 3A	520951						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ② 3.1A	12.6VCT ② 3.3A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T2	Vert. Osc. Trans.	520980	A-8125	A-3003	A- 97X	209T1 ①	B6703	24A87 ①
T3	Horiz. Output Trans.	521066		HVO-8* ②	D-19* ②	232T1 *	FB41 *②	FLY-14*②
T4	Vert. Output Trans.	520975 ③	A-8123 ①	A-3037 ①	A-102X ①	222T1 ①	Z1804 ①	26853 ①
T5A	Yoke-Horiz. (13MH)	520942 ④	DY-9A ⑤⑥	MDF-72 ⑤	Y-17-1 ⑤	21LD2 ⑤ ①	DF602 ⑤⑥	Y-7 ⑤⑥
B	Vert. (37MH)			⑥	⑥			

① Drill one new mounting hole.
② Drill new mounting holes.
③ Includes connectors for deflection yoke leads.
④ Includes leads, connectors, R62 and R63.
⑤ Use original yoke cover and positioning device.
⑥ Remove C111 from yoke terminal strip on top of the vert. output trans.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordorson Replacement Connections
8		Hi-Volt Rect Plate Lead	Hi-Volt Rect. Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead
7		9	9	10	9	9
6	7	7 & 8	8	8	8	7 & 8
5	5	5	6	5	5	
3	T	T	5	4	T	
2	3	3	2 & 3	T or 3	3	
1	1	1	1	1	1	1
Special Notes →					⑦	

⑦ If insufficient width connect a .005MFD, 600V capacitor across terminals #"T" and #3.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T6	4.3KΩ	3.3Ω	509376	A-3877	A-2930	S-3X	Z1001	22546	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	Stewart-Warner PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6 x 9"	PM	3.3Ω	508174	ST-810 Mod. P69-Y	69A2	① Used in Model 21T-9340A
	6"	PM	3.3Ω	509398 ①	ST-108 Mod. P6-X	6A1	② Used in Models 12C-9340P, 21T-9340R, and 21T-9340RB
	4"	PM	3.2Ω	521664 ②	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Stewart-Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil End Indicator	0Ω						
L3	UHF Mixer Coil	0Ω						
L4	UHF Mixer Coil End Indicator	0Ω						
L5	UHF Osc. Coil	0Ω						
L6	UHF Osc. Coil End Indicator	0Ω						
L7	UHF Cathode Choke	0Ω						
L8	UHF IF Choke	.1Ω						
L9	UHF Fil. Choke	.1Ω						
L10	UHF RF Choke	0Ω						
L11	UHF IF Coupling	0Ω						
L12	UHF IF Output Coil	0Ω	0Ω					
L13	UHF IF Coupling Coil	0Ω		521831				UHF IF Strip
B	VHF Ant. Coil	0Ω		521822				Channel 2
C	VHF Ant. Coil	0Ω		521823				Channel 3
D	VHF Ant. Coil	0Ω		521824				Channel 4
E	VHF Ant. Coil	0Ω		521825				Channel 5
F	VHF Ant. Coil	0Ω		521826				Channel 6
G	VHF Ant. Coil	0Ω		521827				Channel 7
H	VHF Ant. Coil	0Ω		521828				Channel 8
I	VHF Ant. Coil	0Ω		521829				Channel 9
J	VHF Ant. Coil	0Ω		521830				Channel 10
K	VHF Ant. Coil	0Ω		521831				Channel 11
L	VHF Ant. Coil	0Ω		521832				Channel 12
M	VHF Ant. Coil	0Ω		521833				Channel 13
L14	VHF Fil. Choke	0Ω		520518				
L15	VHF Neut. Coil	0Ω		520701				
L16	UHF IF Coupling Coil	0Ω		521841				UHF IF Strip
B	VHF RF, Mixer Grid, Osc. Coil	0Ω		521842				Channel 2
C	VHF RF, Mixer Grid, Osc., Coil	0Ω		521843				Channel 3
D	VHF RF, Mixer Grid, Osc., Coil	0Ω		521844				Channel 4
E	VHF RF, Mixer Grid Osc. Coil	0Ω		521845				Channel 5
F	VHF, RF Mixer Grid, Osc. Coil	0Ω		521846				Channel 6
G	VHF RF, Mixer Grid, Osc. Coil	0Ω		521847				Channel 7
H	VHF RF, Mixer Grid, Osc. Coil	0Ω		521848				Channel 8
I	VHF RF, Mixer Grid, Osc. Coil	0Ω		521849				Channel 9
J	VHF RF, Mixer Grid, Osc. Coil	0Ω		521850				Channel 10
K	VHF RF, Mixer Grid, Osc. Coil	0Ω		521851				Channel 11
L	VHF RF, Mixer Grid, Osc. Coil	0Ω	521852	521852				Channel 12
M	VHF RF, Mixer Grid, Osc. Coil	0Ω		521853				Channel 13

STEWART-WARNER MODELS 21C-9325F, G, 21C-9340E, K, KB, L, LB, M, MB, P, 21C-9340A, B, D, R, RB, S, T

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Stewart-Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L17	VHF Fil. Choke	0Ω		520520				
L18	VHF RF Coil	1.3Ω		521834				
L19	VHF RF Choke	0Ω		521835				
L20	VHF Convertor Plate	0Ω		521836				
L21	1st Video IF Grid	1.3Ω						Includes 39.75MC Trap
L22	1st Video IF Plate	1.8Ω						
L23	41.25MC Trap & 47.75MC Trap	1.5 1.1Ω						
L24	2nd Video IF Grid	.8Ω						
L25	3rd Video IF	1.9Ω	1.3Ω					
L26	4th Video IF	1.6Ω	1.5Ω					
L27	Series Peaking Coil	13Ω		520620	19-3180	TV-184	6180	180 Microhenries
L28	Shunt Peaking Coil	20Ω		520985	19-3660		4650	650 Microhenries
L29	Series Peaking Coil	1.4Ω		522020	19-1004		4610	8 Microhenries
L30	4.5MC Trap	1.6Ω		509603	20-1004	TV-151	1470	
L31	Series Peaking Coil	7Ω		520984	19-3160	TV-184	4644	160 Microhenries; Wound on 15KΩ resistor
L32	Shunt Peaking Coil	22Ω		520986	19-3660		4650	660 Microhenries
L33	Sount IF	1.3Ω		509378	16-3445 *	TV-113 *	1470-A	
L34	Ratio Detector	3.8Ω	.7ΩCT	509706	17-3493	TV-115 ■	1498	Tertiary winding=.45Ω
L35	Horiz. Osc.	80Ω		520943	20-1402	TV-162	6183	Slug Core # 521064 Waveform winding -45Ω

* Use one winding only.
■ Use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L36	.170A	73Ω	2.9HY	508341	C-2325	C-2991 ①	C-17X	C5030	26C44

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Stewart-Warner PART No. FUSE	Stewart-Warner PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG Slo-Blo	4A 125V	521803	520989 *	313004 (4A-3AG - Slo-Blo)	357002 *	MDX4	4408 *
M2	3AG	1/4A 250V	508713		312.250 (1/4A-3AG)		AGC 1/4	

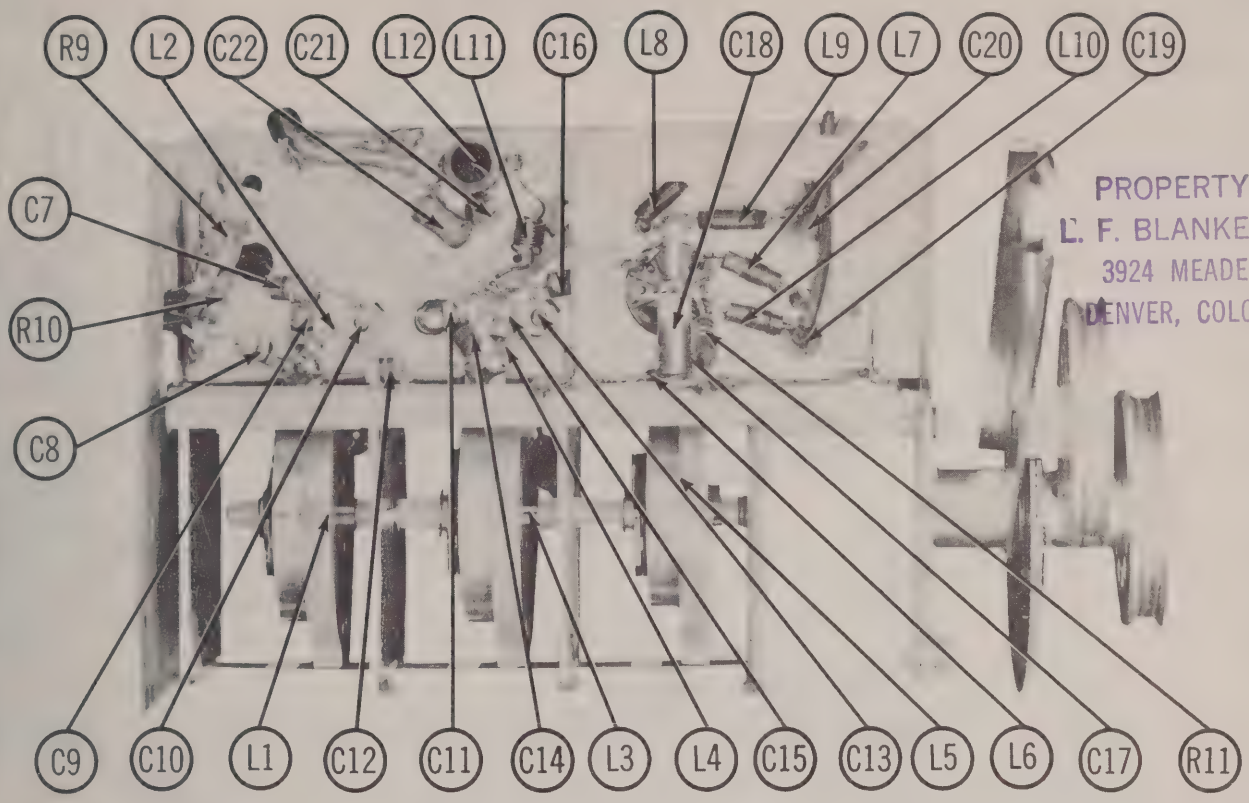
* Holder for M2 also (2 pole fuse holder).

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Stewart-Warner PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M3	1N72		1N82 or 1N82A	1N72A	UHF Mixer
M4	1N64	509386	1N60 or 1N132	1N60 or 1N64A	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M5	Dial Light	118921	#47, Bayonet
M6	Tuner	521187	VHF - Models 21C-9325F & 21C-9325G
M7	Tuner	521170	UHF - Models 21C-9325F & 21C-9325G
	Tuner	521150	VHF-UHF - Models 21C-9340K, KB, L, LB, M, MB, P, 21T-9370A, R, RB, S, T
M8	Switch	521188	VHF-UHF - Models 21C-9325F & 21C-9325G
	Switch	115444	Ant. - Models 21C-9340K, KB, L, LB, M, MB, P, 21T-9340A, R, RB, S, T
M9	Centering Device	521267	Part of yoke corer (T5)
M10	Ion Trap	521183	
M11	IF Printed Circuit	521816	Used when letter "C" is not included in series designation at rear chassis.
	IF Printed Circuit	522088	Used when letter "C" is included in series designation at rear of chassis.
B3	Trimmer Cap.	508071	Horiz.Drive (10-160MMF)
	Cabinet	521105-B	Blonde - Model 21C-9325F
	Cabinet	521105-A	Mahogany - Model 21C-9325G
	Cabinet	521108-A	Leatherette -Tan - Model 21T-9340A
	Cabinet	521591	Mahogany - Model 21C-9340K
	Cabinet	521592	Blonde - Model 21C-9340KB
	Cabinet	521641	Mahogany - Model 21C-9340L
	Cabinet	521642	Blonde - Model 21C-9340LB
	Cabinet	521637	Mahogany - Model 21C-9340M
	Cabinet	521638	Blonde - Model 21C-9340MB
	Cabinet	521881	Mahogany - Model 21T-9340R
	Cabinet	521892	Blonde - Model 21T-9340RB
	Mask	521102-A	Models 21C-9325F, 21C-9325G, 21C-9340L, 21C-9340LB, 21C-9340M, 21C-9340MB, 21T-9340R, 21T-9340RB
	Mask	521133-A	Models 21T-9340A, 21C-9340K, 21C-9340KB, 21C-9340P
	Safety Glass	520494	Models 21T-9340A, 21C-9340K, 21C-9340KB, 21C-9340P
	Safety Glass	520937	Models 21C-9325F, 21C-9325G, 21C-9340C, 21C-9340LB, 21C-9340M, 21C-9340MB, 21T-9340R, 21T-9340RB
	UHF Dial	521282	Models 21C-9325F, 21C-9325G



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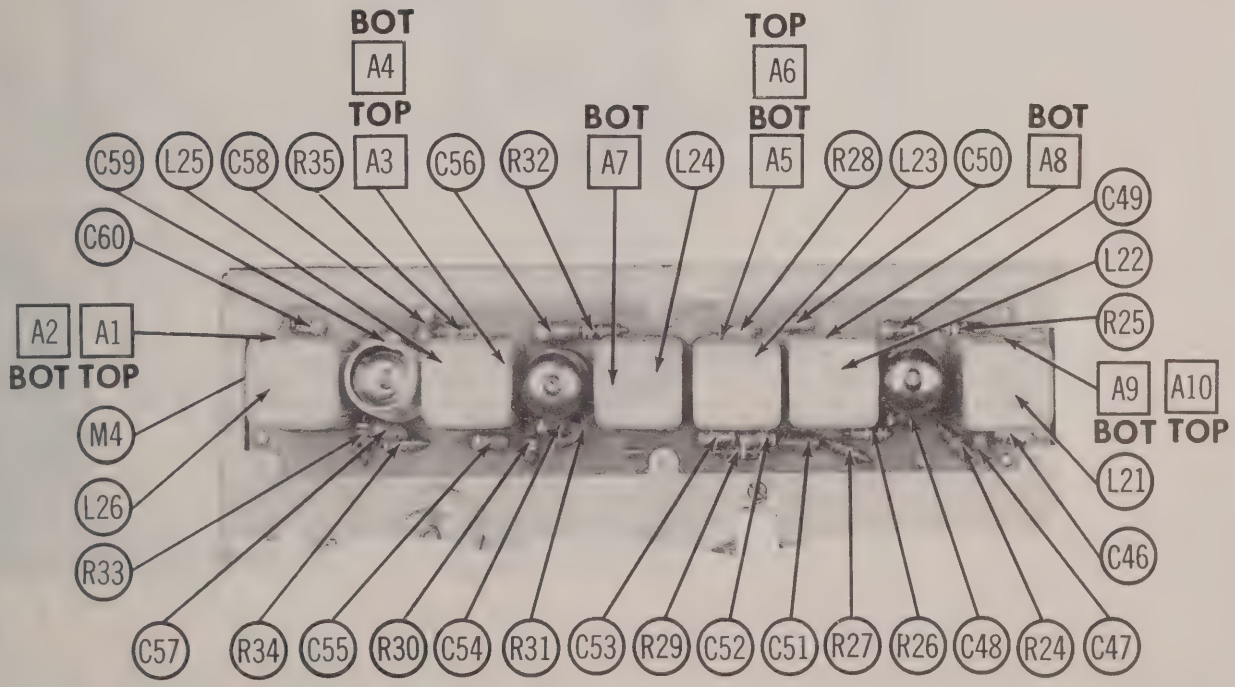
UHF TUNER – BOTTOM VIEW



VIDEO IF STRIP

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. Check M1 fuse. If filaments light, substitute V19. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Substitute V19. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V15, V16, V17 and V18. Check M2 fuse. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C108, C109, C104, C105, R97, R98, R96, R8 and other associated components.	Check L35, C102, C100, C99, C95, R94, R92, R3 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V17, V18 and V19. Check R8 and B3 for proper adjustment. Check R97, R98, T3, T5A and other associated components.

BLOOMING

Check by substitution V16, V17, V18 and V19. Check R97, R98, R107 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video ".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE (VHF)

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V11. Check components in video IF stages.

RASTER, NO SOUND, NO PICTURE (UHF)

Substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

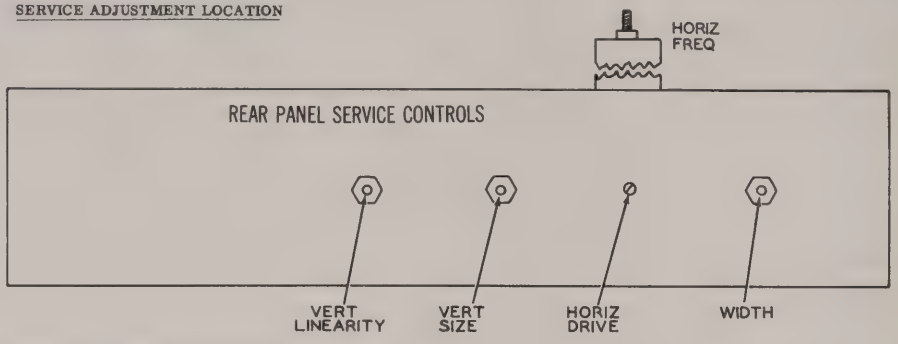
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 3 wood screws holding strip at the top of safety glass. Remove strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For removal of picture tube,remove safety glass, rear cover and ion trap. Disconnect CRT socket and HV lead.Remove 2 nuts on front of tube mount. Remove picture tube.

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Freq. slug(L35) until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L34) located on top of chassis. (See tube placement chart.)

FUSES

Two fuses are used. One for Horiz. Sweep Circuit protection and one for L. V. Power Supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 7 wood screws and 1 metal screw. Remove rear cover.
3. Disconnect speaker leads and built-in antenna.
4. Disconnect 5 chassis bolts. Remove chassis.

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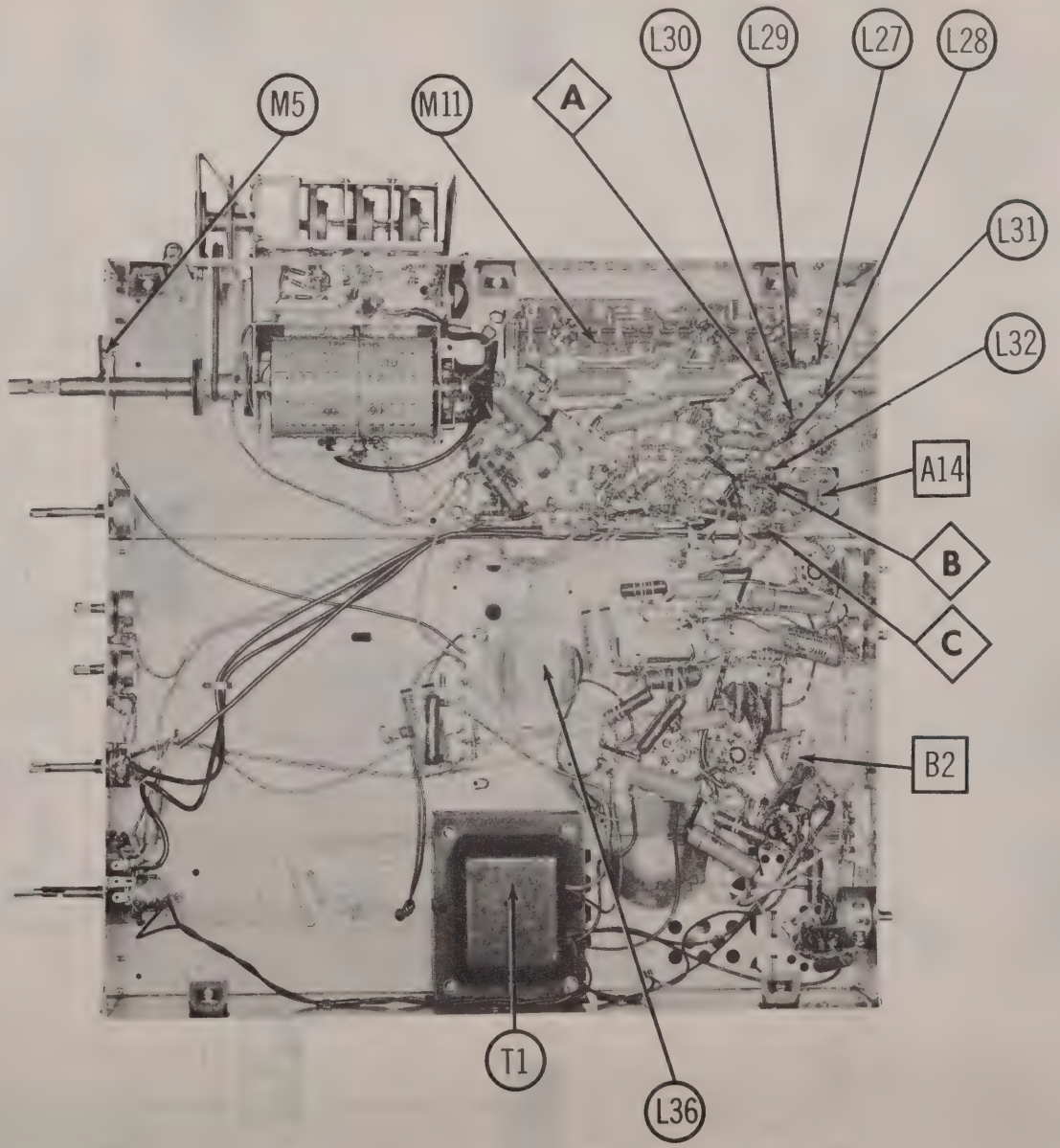
DRIVE CORD STRINGING

TUNING GANG FULLY CLOCKWISE.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 22TQ

STROMBERG-CARLSON
21TM, TQ, 22TM, TQ

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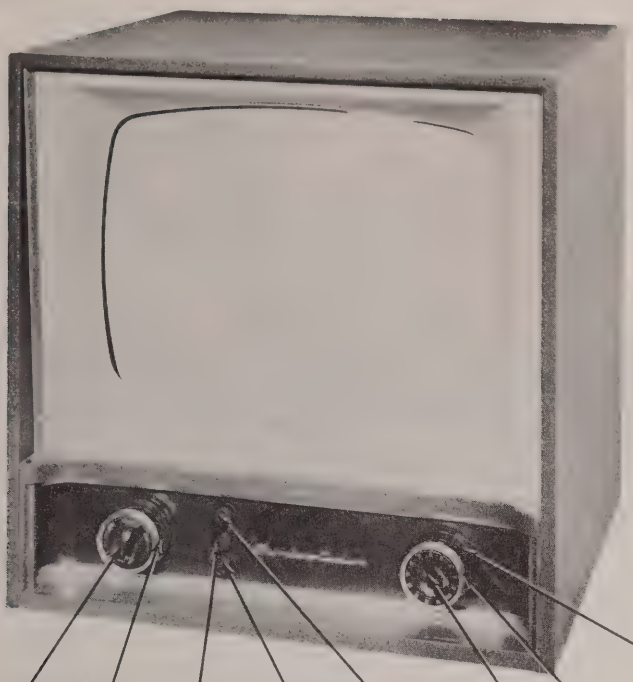

STROMBERG-CARLSON MODEL 22TQ

TRADE NAME	Stromberg-Carlson Models 21TM, 21TQ, 22TM, 22TQ
MANUFACTURER	Stromberg-Carlson Co. -Service Dept., 302 N. Goodman St., Rochester, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty-Four
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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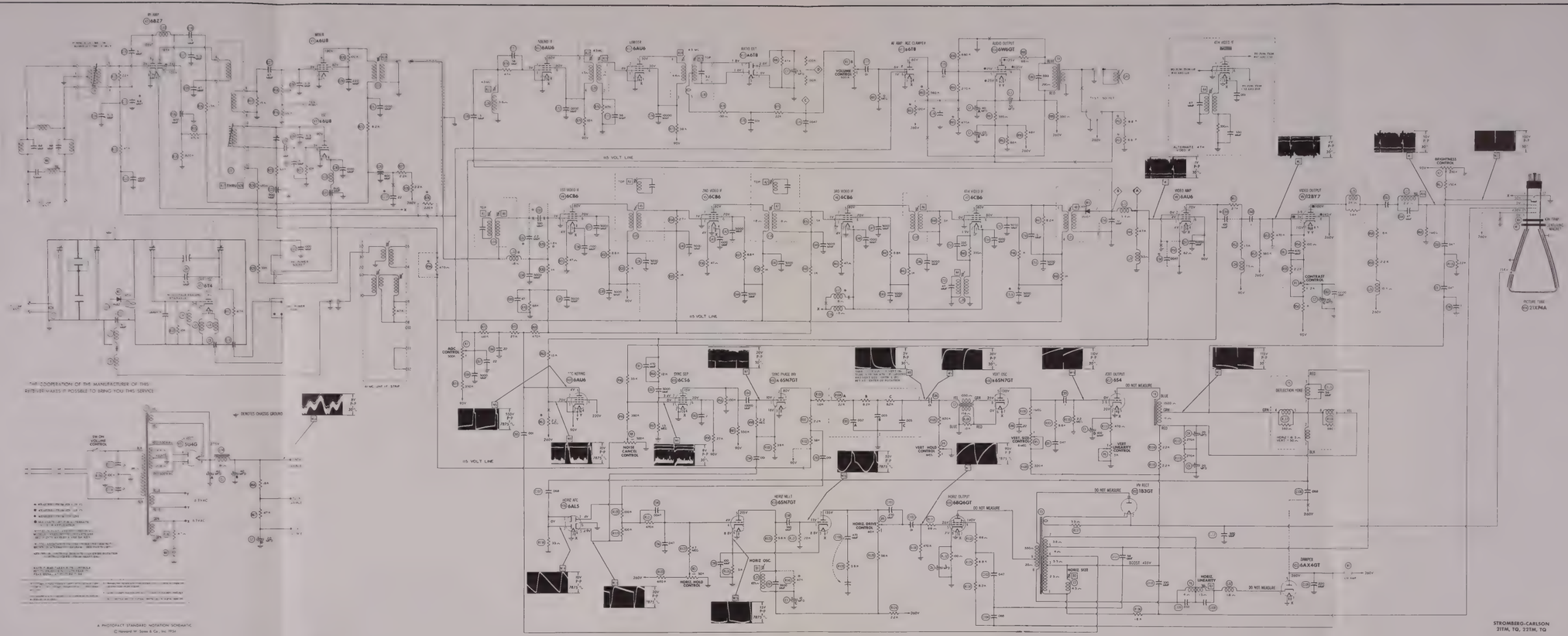
DATE 11-54 SET 258 FOLDER 13

STROMBERG-CARLSON
21TM, TQ, 22TM, TQ


IN ON VOLUME CONTROL
DENOTES CHASSIS GROUND
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO SERVICE YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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STROMBERG-CARLSON 21TM, TQ, 22TM, TQ

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CHASSIS TOP VIEW

STROMBERG-CARLSON
21TM, TQ, 22TM, TQ

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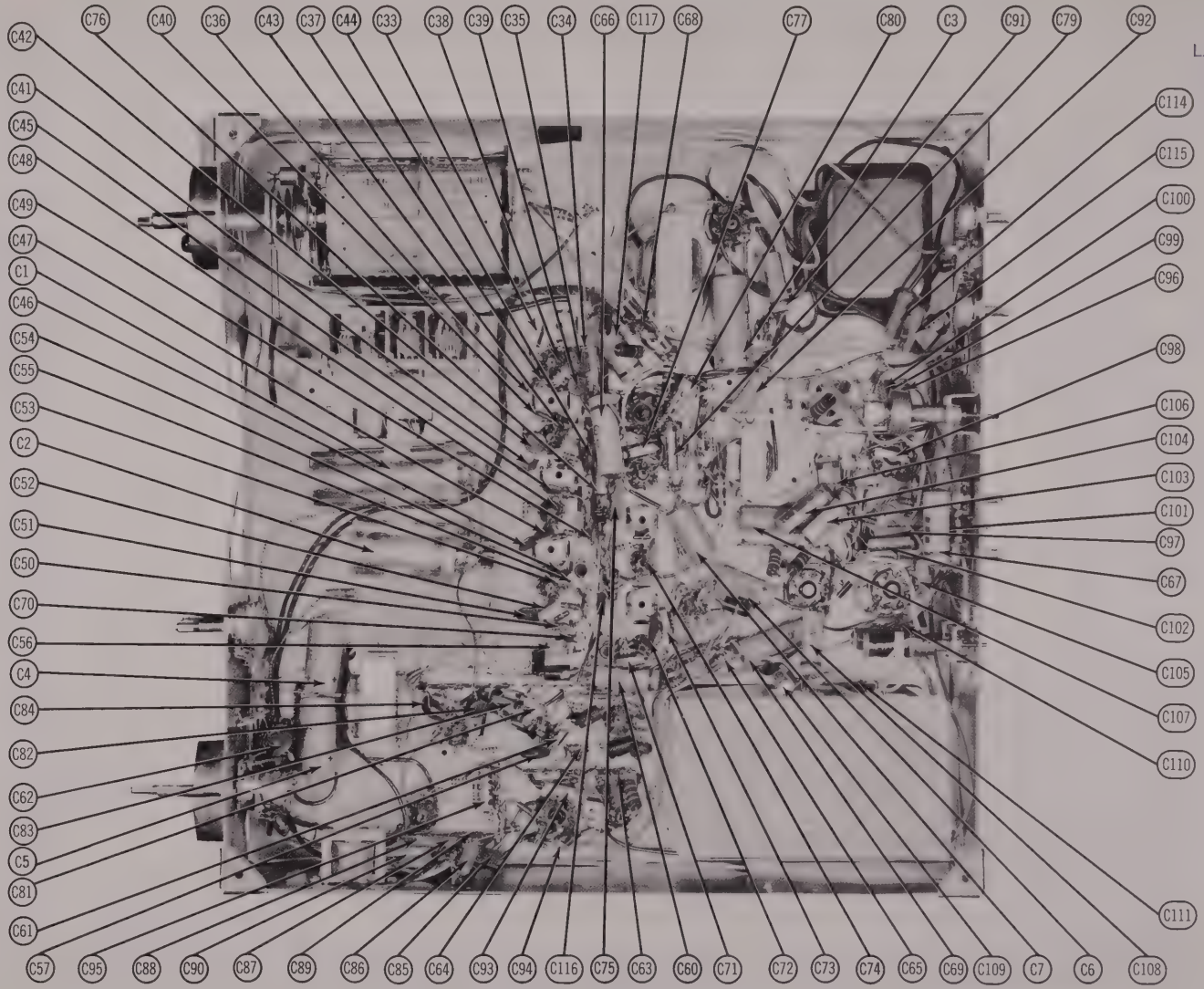

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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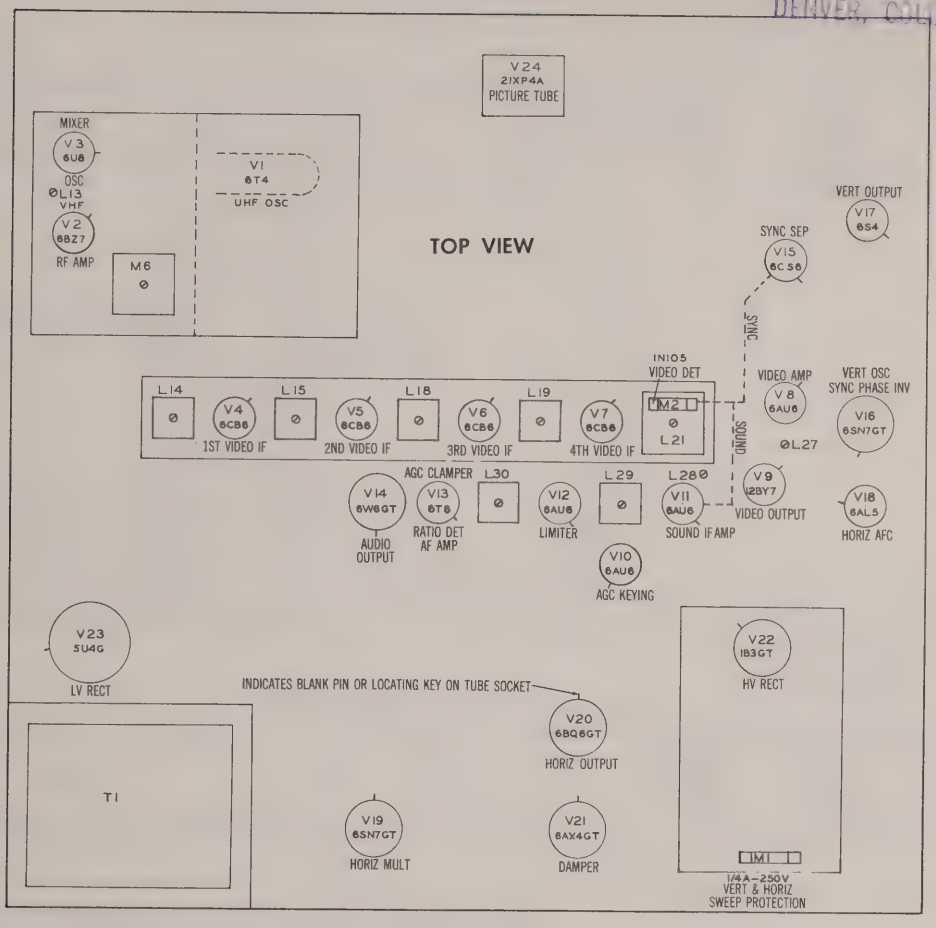
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V14, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V9, V10, V24
Has pic, no sound - V11, V12, V13, V14
Overloaded picture - V10, V13

SYNC FAILURE
No vert. sync - V16,
No horiz. sync - V16, V18, V19
No vert. or horiz. sync - V15, V16

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V24, Fuse (M1)
No vertical deflection - V16, V17
Poor vert. linearity or foldover - V16, V17
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23
Vert. off freq. - V16
Horiz. off freq. - V16, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivbrator tube (V19) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C69. Connect the positive lead to chassis.
Attenuate the sweep generator output to maintain 2 volts peak to peak on scope.
Set the noise cancellation control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	100MMF	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	Not used	39.75MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru 47KΩ to point Ⓐ. Low side to chassis.	A1	Adjust for MINIMUM 400∿ Indication on scope.
2.	"	"	"	47.25MC	"	"	A2	"
3.	"	"	"	41.25MC	"	"	A3, A4	"
4.	"	"	"	43.2MC (Unmod)	"	Use VTVM. DC probe thru 1Meg to point Ⓐ. Low side to chassis.	A5	Attenuate generator output to maintain not more than 1.5 volts at VTVM. Adjust for maximum deflection.
5.	"	"	"	42.0MC	"	"	A6	"
6.	"	"	"	45.0MC	"	"	A7	"
7.	"	"	"	44.5MC	"	"	A8	"
8.	"	"	44MC (10MC Swp)	39.75MC 41.25MC 41.9MC 45.75MC 47.25MC	"	Vert. Amp. thru 47KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A5 thru A8 to obtain desired response. Use high scope gain and sweep generator output to observe trap regions. If necessary, retouch A1 thru A4 for MINIMUM marker amplitude at 39.75MC, 47.25MC and 41.25MC.
9.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis.	"	41.9MC 45.75MC	"	"	A9, A10	Adjust for response similar to Fig. 2.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Pin 2 (plate) of 6T8 (V13) to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓓ. Common to chassis.	A11, A12, A13, A14	Attenuate generator output to maintain 1.5 volts at VTVM. Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. (Increase generator output to provide good deflection at VTVM).

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to point Ⓑ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point Ⓓ. Low side to chassis.	A11, A12, A13, A14	Disconnect stabilizing capacitor C7. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A15	Reconnect stabilizing capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to point Ⓐ. Low side to chassis.	Not used	4.5MC (400∿Mod)	Any non-interfering chassis	Vert. Amp. thru detector (Fig. 6) to pin 2 (grid) of picture tube. Low side to chassis.	A16	Adjust for MINIMUM 400∿ indication on scope.

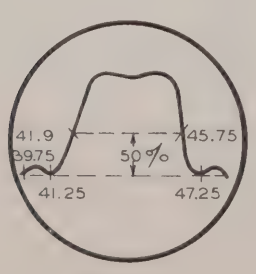


FIG. 1

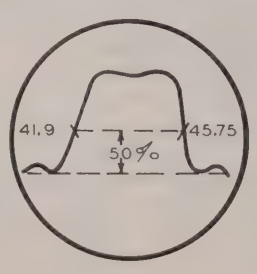


FIG. 2

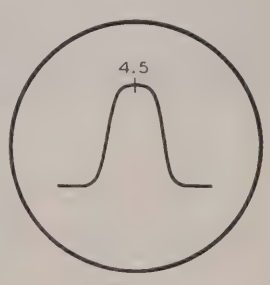


FIG. 3

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ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A16. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A16 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Leave the bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A17	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	

VHF RF AND UHF TUNER ALIGNMENT

The VHF RF and UHF tuner portions of this receiver have been properly aligned at the factory and are very stable. Alignment of these portions should not be required in the field.

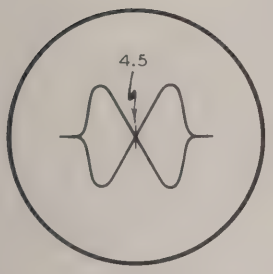


FIG. 4

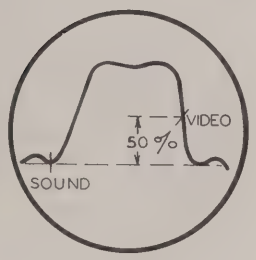


FIG. 5

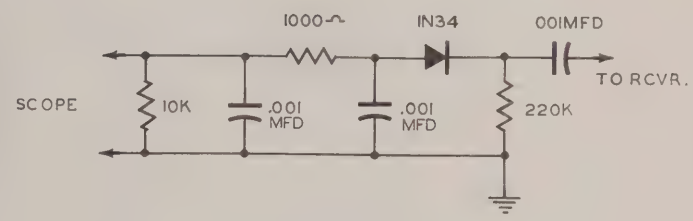
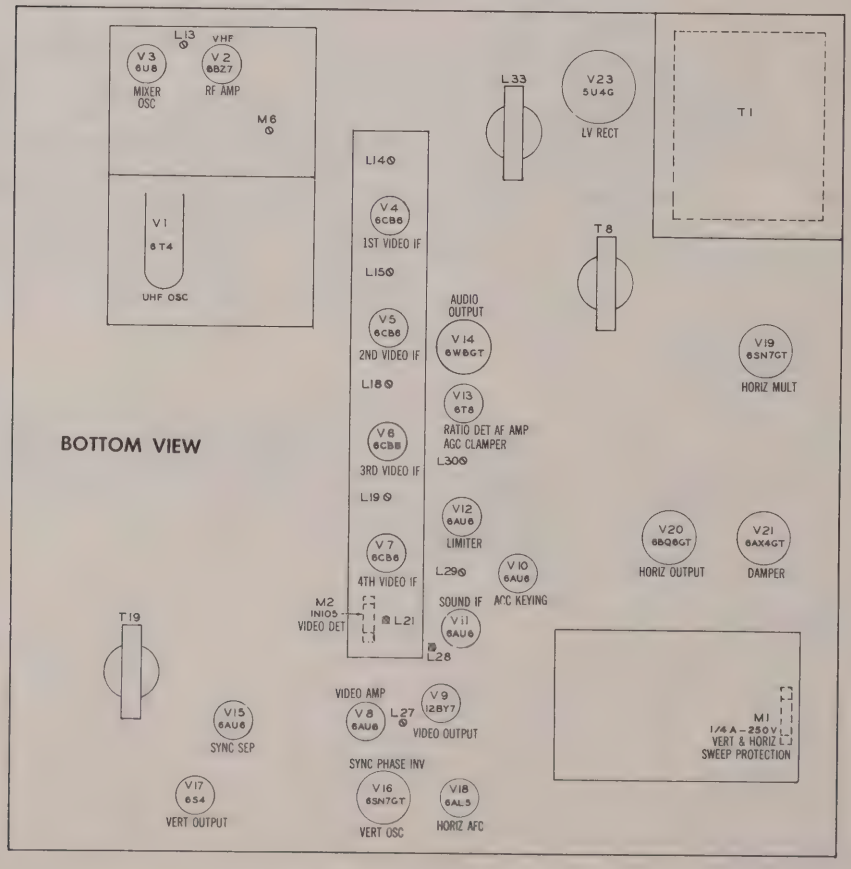


FIG. 6

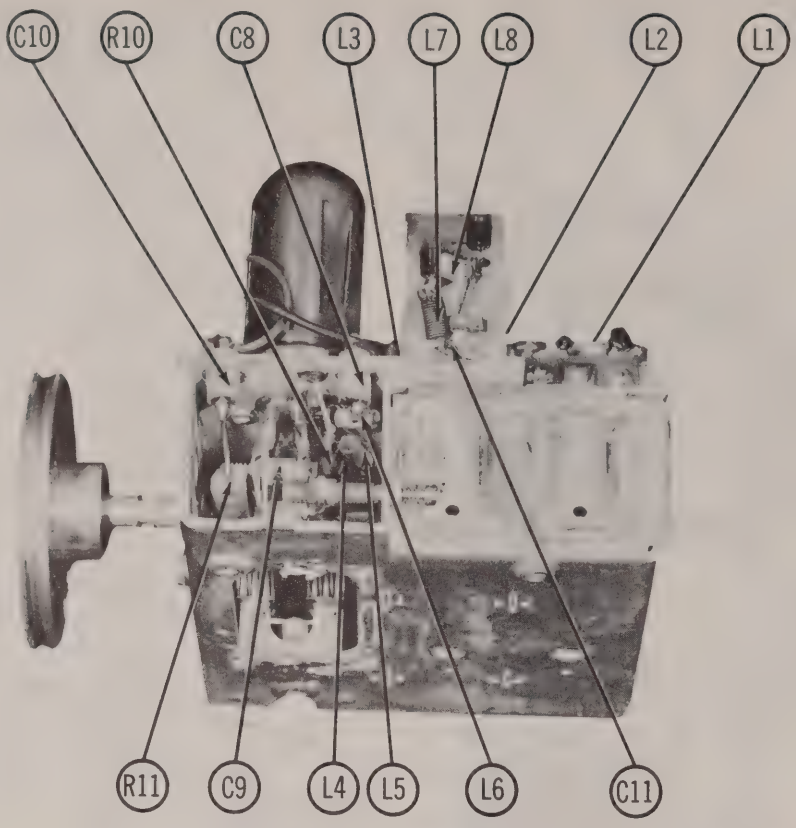
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6T4	♦▲8.8KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	♦▲8.8KΩ		
V 2	6BZ7	†6KΩ	350KΩ	INF	0Ω	.1Ω	INF	500KΩ	0Ω	0Ω
V 3	6U8	♦4.1KΩ	200KΩ	†110KΩ	.1Ω	0Ω	†12.5KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	80KΩ	47Ω	0Ω	.1Ω	†6.6KΩ	†72KΩ	0Ω		
V 5	6CB6	80KΩ	47Ω	0Ω	.1Ω	♦1KΩ	♦6.8KΩ	0Ω		
V 6	6CB6	80KΩ	47Ω	0Ω	.1Ω	♦1KΩ	♦6.8KΩ	0Ω		
V 7	6CB6	.1Ω	330Ω	0Ω	.1Ω	♦1KΩ	♦2KΩ	0Ω		
V 8	6AU6	5KΩ	0Ω	0Ω	.1Ω	†69KΩ	†65KΩ	0Ω		
V 9	12BY7	80KΩ	250KΩ	80KΩ	†65KΩ	†65KΩ	†65KΩ	†4KΩ	†81Ω	80KΩ
V 10	6AU6	†87KΩ	†65KΩ	†65KΩ	†65KΩ	300KΩ	†18KΩ	†65KΩ		
V 11	6AU6	47KΩ	0Ω	0Ω	.1Ω	†75KΩ	†65KΩ	0Ω		
V 12	6AU6	47KΩ	0Ω	.1Ω	0Ω	†105KΩ	†105KΩ	0Ω		
V 13	6T8	520KΩ	47KΩ	520KΩ	.1Ω	0Ω	500KΩ	0Ω	10Meg	†680KΩ
V 14	6W6GT	INF	†65KΩ	†760Ω	470Ω	350KΩ	710Ω	†65KΩ	60KΩ	
V 15	6CS6	28KΩ	0Ω	0Ω	.1Ω	†140KΩ	†92KΩ	1.5Meg		
V 16	6SN7GT	2.2Meg	♦6.2KΩ	3.9KΩ	1.6Meg	▲3.5Meg	156Ω	.1Ω	0Ω	
V 17	6S4	INF	1.4KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	†100KΩ	INF	▲6KΩ
V 18	6AL5	33Ω	33Ω	0Ω	.1Ω	5.3Meg	0Ω	5.3Meg		
V 19	6SN7GT	120KΩ	†96KΩ	1.5KΩ	4.7Meg	†7.8KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6BQ6GT	INF	0Ω	INF	†15KΩ	470KΩ	▲2Ω	.1Ω	100Ω	TOP CAP ▲23Ω
V 21	6AX4GT	INF	INF	250KΩ	INF	†85Ω	▲1.8KΩ	.1Ω	0Ω	
V 22	1B3GT		PIN	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲573Ω
V 23	5U4G	INF	50KΩ	▲4.5KΩ	19.4Ω	12KΩ	20.6Ω	INF	50KΩ	
V 24	21XP4A	.1Ω	1Meg	PIN 6 †85Ω	PIN 10 ▲1.8KΩ	PIN 11 †250KΩ	PIN 12 0Ω			

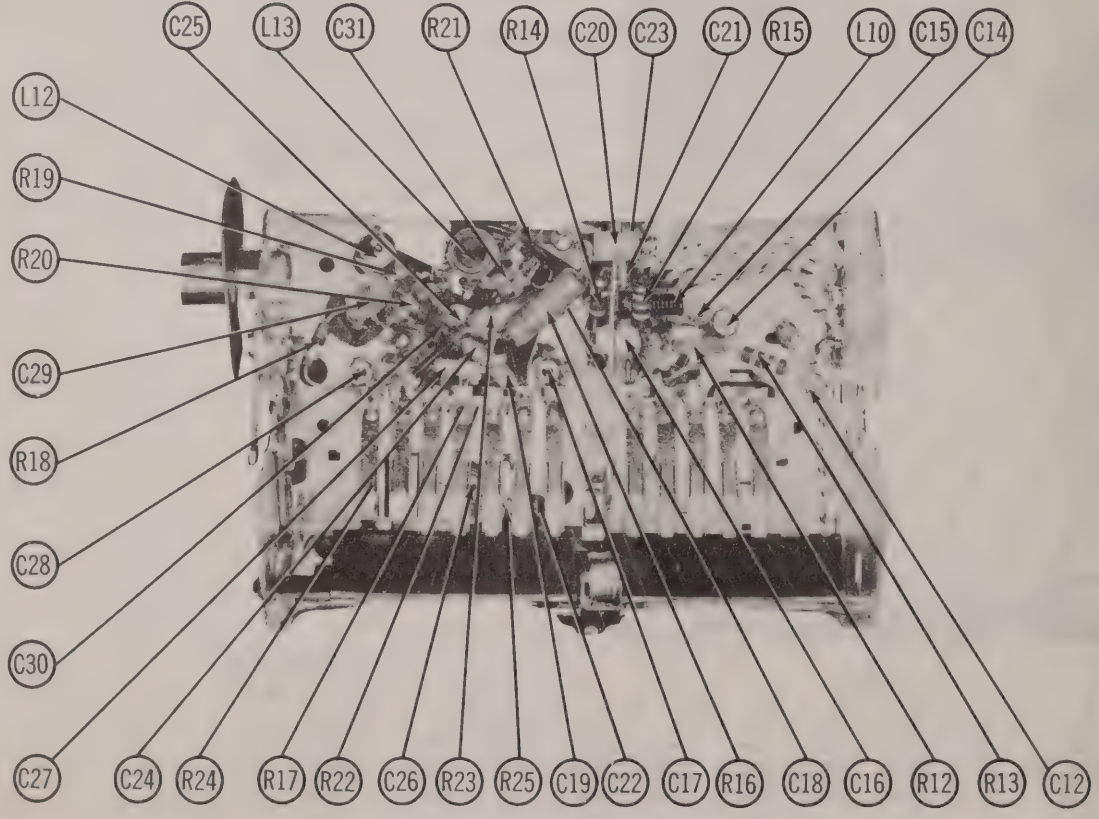
♦ MEASURED FROM 115V LINE
† MEASURED FROM PIN 8 OF V23
▲ MEASURED FROM PIN 3 OF V21
▲ MEASURED IN UHF POSITION



TUBE PLACEMENT CHART



UHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

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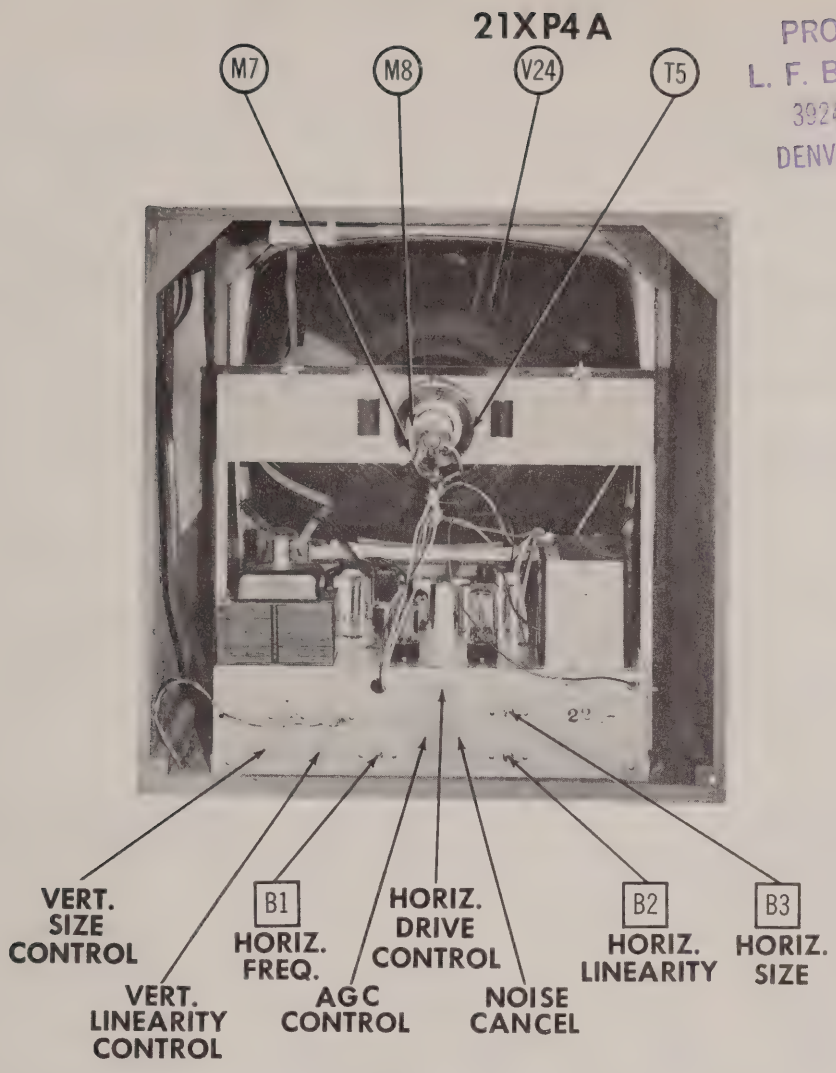

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive control for best compromise between brightness and horizontal linearity.

Adjust the horizontal size slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

NOISE CANCELLATION CONTROL ADJUSTMENT

All necessary horizontal sweep circuit adjustments should be made before adjustment of noise cancellation control.

Tune to the strongest TV signal available.

Starting with the control in extreme counter clockwise position, turn control clockwise until the picture starts to distort or lose sync, then back off the control until the picture is stable and undistorted.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V20, V21 and V23. Check adjustments R9, B2 and B3. Check T3, T5A, T7, R135, R134, R132, C6 and other associated components.

DRIVE LINES

Check by substitution V20 and V21. Check adjustments R9 and B3. Check C102, C101, R134, R135 and other associated components.

COMPRESSED LEFT SIDE

Check by substituion V20 and V21. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check C96 for open. Check L31, C97, R125 and other associated components.

XMAS TREE EFFECT

Check by substitution V19, V20 and V21. Check T3 and T5A for internal arcing. Check L31, C97, C98, R123, R129 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R115, R114, R111, C90 and other associated components.	Check T2, R109, R5, R108, C89 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V16 and V17. Check vertical size and vertical linearity controls for proper operation. Check T4 and T5B.

COMPRESSED AT BOTTOM

Check by substitution V16 and V17. Check R109, R5, R108, R111 and other associated components.

COMPRESSED AT TOP

Check by substitution V16 and V17. Check R111, R6, C1D and other associated components.

FOLDS

Check by substitution V16 and V17. Check R107, C87, R111 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V15 and V16. Check C81, C82, C84, C83, R65, R98, R102, R101 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V16. Check T2, R105, R4 and C86. Check vertical integrator network for component failure or change of value.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check C93, C94, L31, C97, R119, R120 and R123. Check AFC network.

HORIZONTAL BENDING

Check by substitution V15, V16, V18 and V19. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9, Check C60, C57, C63, L24, L26, R52, R51, R59, R58, R61 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A16 Check video IF alignment.

POOR CONTRAST

Check by substitution V8 and V9. Check contrast control, picture tube, C2C, C58 and R54. Check video detector crystal network.

NEGATIVE PICTURE

Check by substitution V8 and V9. Check picture tube. Check video detector crystal network. Check R61, C2C, L22, L23 and other associated components.

SMEAR

Check by substitution V8 and V9. Check L23, L24, L25, L26, C60, C57 and other associated components. Check AGC network.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7, V8 and V9. for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13 and V14. Check stages V13 and V14 using audio signal generator. Apply signal across C76.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C77, C79, C80, R89, R90, R82, speaker, T8 and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A15 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under " Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check by substitution V23. Check B+ filter and decoupling network for failure or change of value.

SMALL AND/OR DIM PICTURE

Substitute V23. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

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TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stromberg-Carlson PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6T4	6T4	7DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	Mixer-Osc.	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	4th. Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	Video Output	12BY7	12BY7	9BF	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Det.-AF Amp.-AGC Clamper	6T8	6T8	9E	
V14	Audio Output	6W6GT	6W6GT	7S	
V15	Sync Separator	6CS6	6CS6	7CH	
V16	Sync Phase Inv.-Vert. Osc.	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6S4	6S4	9AC	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	Stromberg-Carlson PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V24	21XP4A	21XP4	21XP4	21XP4A 21XP4	21XP4	12L 12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450	11115	AFH4-87		D066		FP431.7	TVL-4747	
B	■40	450								
C	▲10	450								
D	100	50								
C2A	▲40	250	11113	AFH4-02		D121		FP447	TVL-4579	
B	■20	250								
C	▲40	250								
D	20	250								
C3	50	300	111114	PRS450/50		BR5035		TC68	TVA-1613	
C4	20	300	111089	PRS450/20		BR2035		TC65	TVA-1608	
C5	20	300	111089	PRS450/20		BR2035		TC65	TVA-1608	
C6	5	50	111093	PRS150/4		BR550		TC30	TVA-1303	
C7	5	50	111093	PRS150/4		BR550		TC30	TVA-1303	
C8	Feed-thru									
C9	.5-5		171826							
C10	Feed-thru									
C11	30		171828							
C12	1000		171227	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C13	6.8		171234	SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	Note 1
C14	.5-3		171212		829-3		3115-01-0R5	CT565A		
C15	3		171225	SI3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C16	800		171218	EF-001	MFT-1000				503C-D1	
C17	.5-3		171212		829-3		3115-01-0R5	CT565A		
C18	1.5		171821	SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C19	47		171230	BPD-000047	D6-470	G033		UC-5447	5GA-Q47	
C20	800		171218	EF-001	MFT-1000				503C-D1	
C21	800		171218	EF-001	MFT-1000				503C-D1	
C22	1000		171227	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C23	800		171218	EF-001	MFT-1000				503C-D1	
C24	10		171232	SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C25	5		171825							
C26	.5-3		171212		829-3		3115-01-0R5	CT565A		
C27	47		171822	SI47	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C28	.5-3		171212		829-3		3115-01-0R5	CT565A		
C29	220		171823	BPD-00022	D6-221	G051		UC-5322	5GA-T22	
C30	1000		171227	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	1000		171227	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	Note 1
C33	330		110463	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	Note 1
C34	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C38	1000		110824	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C40	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C41	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C42	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C43	1000		110824	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C44	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C45	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C48	1000		110824	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C49	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	5		110598	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C51	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C53	330		110463	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C54	1000		110824	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	47		110458	SI47NP0	TCZ-47	TZ22	NP0K-470	ZT-5447	5TCC-Q47	
C56	10		110469	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA Stromberg-Carlson PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C57	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C58	.0047	400	110716	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 1
C59	100		110401	SI100	D6-101	TP94	GP1K-101	UC-531	5GA-T1	Note 1
C60	.1	400	110724	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C61	470		110464	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C62	10000		110672	BPD-01	DD-103	K083	811-01	DC-511	5HK-S1	
C63	.1	400	110724	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C64	47		110470	SI47NP0	TC2-47	TC232	NP0K-470	ZT-5447	5TCC-Q47	
C65	.001	1000	110562	P1088-001	DD16-102	CUB16D1	1N5KV-102	PT6201	MB-D1	
C66	.22	400	110726	P488-22		CUB4P22		PT4022	4TM-P22	
C67	.22	400	110726	P488-22		CUB4P22		PT4022	4TM-P22	
C68	5000		110586	BPD-005	DD-502	K085	811-005	DC-525	5HK-D5	
C69	.47	300	110709	P288-47		CUB2P47		PT4047	2TM-P47	
C70	5			SI5NP0	TC2-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C71	56	500	110253			22R5Q56				
C72	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C73	56	500	110253			22R5Q56				
C74	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C75	.001	400	110534	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C76	.0047	400	110716	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C77	.01	400	110718	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C78	.1	600	110724	P688-1	DF-104	CUB6P1		PT601	6TM-P1	Note 1
C79	.01	400	110718	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C80	.033	600	110740	P688-033		CUB6S33		PT6333	6TM-S33	
C81	470		110464	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C82	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C83	.1	400	110724	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C84	10000		110672	BPD-01	DD-103	K083	811-01	DC-511	5HK-S1	
C85A	.002							PT622		
B	.005		*128200	*PA-110	*PC-100	*115TMI	*140S-01	PT625	*V-1	
C	.005							PT625		
C86	.01	400	110718	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C87	.047	600	110741	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C88	.22	600	110745	689-25		CUB6P25		PT6025	6TM-P25	
C89	.1	600	110743	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C90	.1	600	110743	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C91	.047	600	110741	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C92	.047	400	110722	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C93	.001	400	110534	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C94	.001	400	110534	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C95	.0047	400	110716	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C96	.047	600	110103	P286-047	DF-503	CUB2S47		PT4147	2TM-S47	
C97	3900	500	110309	464-004		1R5D39		MCB463	MS-24	
C98	390	500	110262	469-0004		1R5T39		MCB243	MS-34	
C99	100	500	110231	469-0001		22R5T1		MCB235	MS-31	
C100	470	500	110263	469-0005		1R5T47		MCB245	MS-35	
C101	270	500	110260	469-0003		1R5T27		MCB241	MS-33	
C102	.01	600	110727	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C103	.047	600	110741	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C104	.068	400	110723	P488-068		CUB4S68			4TM-S68	
C105	.0025	500	110207	469-00025	D6-231	5W5T25	GP2K-221	MC240	5GA-T22	
C106	.068	600	110742	P688-068		PJ6S68			6TM-S68	
C107	.068	1000	110573	P1088-068		PM10S68				
C108	.1	400	110724	P488-1		CUB4P1		PT401	4TM-P1	
C109	.033	400	110721	P488-033		CUB4S3		PT4133	6TM-S3	
C110	330		110454	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C111	56	7000	110819						7SGA-Q56	
C112	500	20000	110830	HV20C	TV3-502	MMU20T5	413	HV30035A	20DK-T5	
C113	56	2000			DD30-560		3KV-560		20GA-Q56	
C114	.01	1000	110568	P1088-01	DD16-103	CUB16S1		PT161	MB-S1	
C115	.01	1000	110568	P1088-01	DD16-103	CUB16S1		PT161	MB-S1	
C116	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 1
C117	.22	600	110745	684-25		CUB6P25		PT6025	6TM-P25	Note 1

Note 1. Not used in all versions.
♦ Items C85A, C85B, C85C, R104A, R104B, R104C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stromberg-Carlson PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2000Ω	½	145164	* QJ-20	RTV-474	F1-10	UF-23R	Contrast-Panel
B	500KΩ					R2-41	UF55A	Volume-Rear
C	Switch					KB-1	US26	Attach to R1B
R2A	250KΩ	½	145157	QU1-130	A47-250K-S	AB-50	U46	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	500KΩ	½	145161	QU1-133	A47-500K-S	AB-31	U35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	1 Meg	½	145160	QU1-137	A47-1Meg-S	AB-54	U34	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5A	6 Meg	½	145159	QU1-142	A47-7.5Meg-S	AB-87	U32	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω	½	145158	QU1-114	A47-5000-S	BX-10	U14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A
R7A	500KΩ	½	145163	Not Req.	A47-500K-S	BX-59	U50	AGC
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R7A
R8A	500KΩ	½	145163	QU1-133	A47-500K-S	BX-59	U50	Noise cancellation
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to 8A
R9A	40KΩ	½	145162	QU1-123	A47-40K-S	BX-31	U35	Horiz. drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-110 & P1-126 (Panel)
B13-133 & R2-216 (Rear) & SWITCH 76-1.
† Universal replacement (Mallory exact duplicate Part No. UF22JR.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Stromberg-Carlson PART No	IRC PART No.	NOTES
R10	10KΩ	½	149178	BTA-10K	
R11	4700Ω	1	149183	BTA-4700	
R12	22KΩ	½	149384	BTS-22K	
R13	47KΩ	½	149311	BTS-47K	
R14	820KΩ	½	28190	BTS-820K	
R15	470KΩ	½	28187	BTS-470K	
R16	150ΩH	½	149178	BTA-150Ω	
R17	15KΩ	½	28172	BTS-15K	
R18	100KΩ	½	149385	BTS-100K	
R19	100KΩ	½	149385	BTS-100K	
R20	100KΩ	½	149385	BTS-100K	
R21	8200Ω	½	28169	BTS-8200	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Stromberg-Carlson PART No	IRC PART No.	NOTES
R22	10KΩ	½	28170	BTS-10K	
R23	3300Ω	½	149181	BTA-3300	
R24	1200	½		BTS-120	
R25	33KΩ	½	149110	BTS-33K	
R26	220KΩ	½	149115	BTS-220K	Note 1
R27	2200Ω	2		BTB-2200	
R28	2200Ω	2	149101	BTB-2200	
R29	1800Ω	½	28163	BTS-1800	Note 2
R30	1000Ω	½	28158	BTS-1000	
R31	47Ω	½	28142	BTS-47	
R32	6800Ω	½	28168	BTS-6800	
R33	1000Ω	½	149101	BTS-1000	
R34	2700Ω	½	28163	BTS-2700	
R35	1000Ω	½	28158	BTS-1000	
R36	47Ω	½	28142	BTS-47	
R37	6800Ω	½	28168	BTS-6800	
R38	1000Ω	½	149101	BTS-1000	
R39	1500Ω	½	28160	BTS-1500	
R40	1000Ω	½	28158	BTS-1000	
R41	47Ω	½	28142	BTS-47	
R42	6800Ω	½	28168	BTS-6800	
R43	1000Ω	½	149101	BTS-1000	
R44	1500Ω	½	28160	BTS-1500	
R45	330Ω	½	28152	BTS-330	
R46	1000Ω	½	149101	BTS-1000	
R47	92000Ω	½	149101	BTS-8200	
R48	1000Ω	½	149101	BTS-1000	
R49	4700Ω	½	28166	BTS-4700	
R50	82Ω	½	28145	BTS-82	
R51	2700Ω	½	28163	BTS-2700	
R52	1500Ω	½	28160	BTS-1500	
R53	470KΩ	½	28187	BTS-470K	
R54	100Ω	½	149005	BTS-100	
R55	2200Ω	½	149103	BTS-2200	
R56	100Ω	½	149138	BTA-1000	
R57	360KΩ	½	28183	BTS-360K	
R58	1800Ω	2	149047		
R59	2200Ω	2	149078		
R60	1 Meg	½	149119	BTS-1 Meg	
R61	150KΩ	½	149114	BTS-150K	
R62	2.2Meg	½		BTS-2.2Meg	Note 1
R63	15KΩ	½	149108	BTS-15K	
R64	12KΩ	½	28171	BTS-12K	
R65	330KΩ	½	149116	BTS-330K	
R66	100KΩ	½	149113	BTS-100K	
R67	47KΩ	½	149148	BTA-47K	
R68	18KΩ	½	28173	BTS-18K	
R69	470KΩ	½	149117	BTS-470K	
R70	68KΩ	½	149112	BTS-68K	
R71	27KΩ	½	149403	BTA-27K	
R72	100KΩ	½	149113	BTS-100K	
R73	330KΩ	½	149116	BTS-330K	
R74	47KΩ	½	149111	BTS-47K	
R75	10KΩ	½	149107	BTS-10K	
R76	47KΩ	½	149111	BTS-47K	
R77	39KΩ	½	28176	BTS-39K	
R78	15ΩJ	½	149098	BTS-150	
R79	22KΩ	½	149109	BTS-22K	
R80	47KΩ	½	149111	BTS-47K	
R81	10 Meg	½	149125	BTS-10 Meg	
R82	560KΩ	½	28184	BTS-560K	Note 3

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Stromberg-Carlson PART No	IRC PART No.	NOTES
R83	120KΩ	½	28181	BTS-120K	Note 1
R84	270KΩ	½	28184	BTS-270K	
R85	470KΩ	½		BTS-470K	Note 1
R86	680KΩ	½	28188	BTS-680K	
R87	390Ω	2	149039	BTB-390	
R88	68Ω	2	149094	BTB-68	
R89	390Ω	2	149039	BTB-390	
R90	68KΩ	1	149149	BTA-68K	
R91	68KΩ	1	149149	BTA-68K	
R92	6800Ω	2		BTB-6800	Note 1
R93	6800Ω	2		BTB-6800	Note 1
R94	470Ω	1		BTA-470	Note 1
R95	390KΩ	½	28186	BTS-390K	
R96	33KΩ	½	28175	BTS-33K	
R97	1.5Meg	½	149120	BTS-1.5Meg	
R98	27KΩ	1	149403	BTA-27K	
R99	2.2Meg	½	149121	BTS-2.2Meg	
R100	3900Ω	½	28165	BTS-3900	
R101	2200Ω	½	149103	BTS-2200	
R102	3900Ω	½	28165	BTS-3900	
R103	100KΩ	½	149113	BTS-100K	
R104	22KΩ			BTS-22K	
B	8200Ω	½	* 128200	BTS-8200	
C	8200Ω			BTS-8200	
R105	820KΩ	½	28190	BTS-820K	
R106	10KΩ	1	149407	BTA-10K	
R107	6800Ω	½	28168	BTS-6800	
R108	1 Meg	½	28191	BTS-1 Meg	
R109	220KΩ	½	149115	BTS-220K	
R110	2.2Meg	½	149121	BTS-2.2Meg	
R111	470Ω	1	149136	BTA-470	
R112	270KΩ	½	28184	BTS-270K	
R113	270KΩ	½	28184	BTS-270K	
R114	2200Ω	2	149078	BTB-2200	
R115	2200Ω	2	149078	BTB-2200	
R116	22KΩ	½	149109	BTS-2200	
R117	560Ω	½		BTS-560	
R118	560Ω	½		BTS-560	
R119	100KΩ	½	149385	BTS-100K	
R120	100KΩ	½	149385	BTS-100K	
R121	470KΩ	½	149117	BTS-470K	
R122	4.7Meg	½	149123	BTS-4.7Meg	
R123	680KΩ	½	28189	BTS-680K	
R124	2200Ω	2	149039	BTB-2200	
R125	5600Ω	1	149184	BTA-5600	
R126	1500Ω	½	28180	BTS-1500	
R127	120KΩ	½	28181	BTS-120K	
R128	5600Ω	½	28167	BTS-5600	
R129	56KΩ	½	28178	BTS-56K	
R130	470KΩ	½	149117	BTS-470K	
R131	68Ω	½	149094	BTS-68	
R132	100Ω	2	149070		
R133	68Ω	½	149094	BTB-68	
R134	8200Ω	2	149054	BTB-8200	
R135	6800Ω	2	149053	BTB-6800	
R136	1800Ω	½	28161	BTS-1800	
R137	3.3Ω	½	149419		
R138	33Ω	1	149161		
R139	100KΩ	½	149113	BTS-100K	
R140	4.7Ω				
R141	47KΩ	½		BTS-47K	

Note 1. Not used in all versions.
Note 2. Some models may use a 10KΩ resistor in this application.
Note 3. Some models may use 270KΩ resistor in this application.
♦ Items R104A, R104B, R104C, C85A, C85B, C85C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ①	610VCT ② 1.7A	5VAC ③ 3A	161446	P-8335 ②	P-3055	R-49BC ①			
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ③ 2.4A	6.3VAC ③ 9A								

① Parallel and phase 6.3V ③ 1.2A and 6.3V ③ . 9A windings for Sec. # 2.
② Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Stromberg-Carlson PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordarson PART No
T2	Vert. Osc. Trans.	161271	A-8125	A-3003	A-97X	209T1 ①	B6703	24A87 ①
T3	Horiz. Output Trans.	161048		HV-9 ♦	D-19*	225T1 *	F3411 *	F1V-12 *
T4	Vert. Output Trans.	161269	A-8123	A-3037	A-102X	222T1	21604	26S12
T5A	Yoke-Horiz.(14.5MH)	114754 ④	DY-9A ④	MDF-73 ④	Y-17-1 ④	21UD2 ④	DF503 ④	Y-7 ④
B	Vert. (38MH)	114755 ④ ⑤						
T6	Horiz.Lin.Coil (1.2-5.3MH tapped)	114084	WC-8	MWC-5 ⑤		209R1		WC-17
T7	Width Coil (1-7MH)	114133	WC-8	MWC-8 ⑤	WC-12 ⑤	21UR1		WC-17 ⑦

① Drill one new mounting hole.
② Includes capacitor C13, resistors R17 and R18.
③ Alternate deflection yoke.
④ Use original yoke cover and positioning device.
⑤ Enlarge mounting hole.
⑥ Connect to coded blue and green terminals.
⑦ Do not use tap.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	9		9	9	9	9	9
	8	See Note ③	8	8	See Note ③	8	8
	7		NC	7	7	NC	7
	5		5	5	5	5	5
	4		4	4	4	4	4
	3		3	3	3	3	3
	1		1	1	1	1	1
Connect Width Coil Across	3 & 1		3 & 1	3 & 1	3 & 1	3 & 1	3 & 1
Special Notes		①			②		

① Connect cathode of damper, thru L32 to terminal #8. The linearity coil and capacitors C108 and C109 may be connected in plate circuit of damper as shown on instruction sheet packed with unit, or left out of circuit entirely, depending on best linearity.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA Stromberg-Carlson PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No.	NOTES
T8	2KΩ	2.8Ω	161267	A-3878	A-2928	S-2X	Z1102 ①	24S50	① Tape 5 & tap

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V	RATINGS C	RATINGS IMP	REPLACEMENT DATA Stromberg-Carlson PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	4 x 6"	PM	2.9Ω			155290 155821	46J6	46A07	① Alternate PM Speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA Stromberg-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	UHF Ant. Coil	0Ω		171837				
L2	UHF Mixer Coil	0Ω		171835				
L3	UHF Osc.Coil	0Ω		171836				
L4	UHF Cathode Choke	0Ω		171832				
L5	UHF Fil. Choke	0Ω		171833				
L6	UHF Fil. Choke	0Ω		171834				
L7	UHF IFCoil	0Ω		171831				
L8	UHF IF Coil	0Ω						
L8A	VHF Ant.Coil	0Ω		171902				Channel 2
B	VHF Ant. Coil	0Ω		171903				Channel 3
C	VHF Ant.Coil	0Ω		171904				Channel 4
D	VHF Ant.Coil	0Ω		171905				Channel 5
E	VHF Ant.Coil	0Ω		171906				Channel 6
F	VHF Ant.Coil	0Ω		171907				Channel 7
G	VHF Ant. Coil	0Ω		171908				Channel 8
H	VHF Ant. Coil	0Ω		171909				Channel 9
I	VHF Ant.Coil	0Ω		171910				Channel 10
J	VHF Ant.Coil	0Ω		171911				Channel 11
K	VHF Ant.Coil	0Ω		171912				Channel 12
L	VHF Ant.Coil	0Ω		171913				Channel 13
L10	VHF Neut. Coil	0Ω		171829				
L11	RF, Mixer Grid & Osc. Coils	0Ω		171830				
L12	VHF Fil.Choke	0Ω						
L13	VHF Conv. Plate Coil	.1Ω		171839				
L14	1st Video IF	2Ω		114430			6219 ♦	
L15	2nd Video IF	.1Ω	.1Ω	114421			6332	Includes 41.25MC Trap
L16	Fil. Choke	1.8Ω		114693	19-1002		4606	2.2 Microhenries; IRC Part No. CLA
L17	Fil. Choke	1.8Ω		114693	19-1002		4606	2.2 Microhenries; IRC Part No. CLA
L18	3rd Video IF	.1Ω	.1Ω	114422			6233	Includes 47.25MC Trap
L19	4th Video IF	.1Ω	.1Ω	114423			6232 ♦	
L20	41.25MC Trap	0Ω	0Ω	114426			6219	
L21	5th Video IF	0Ω	0Ω	114424				
L22	Series Peaking Coil	3.4Ω		114756	19-3036	TV-180	6175	36 Microhenries
L23	Shunt Peaking Coil	5.5Ω		114745	19-3075	TV-181	6172	100 Microhenries
L24	Shunt Peaking Coil	7.5Ω		114639	19-3125		6153	135 Microhenries
L25	Series Peaking Coil	24Ω		114760	19-3250 ♦	TV-185 ♦	6181 ♦	250 Microhenries; wound on 5.6KΩ resistor
L26	Shunt Peaking Coil	10.5Ω		114759	19-3250	TV-185	6181	250 Microhenries
L27	4.5MC Trap	2.2Ω		114417	20-1004	TV-151	1469	
L28	1st Sound IF	3.6Ω		114419	20-1004 ▲	TV-151 ▲	1470	

STROMBERG-CARLSON
21TM, TQ, 22TM, TQ

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Stromberg-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L29	2nd Sound IF	1.7	1.7Ω	114401	16-3445 †	TV-113	6203	
L30	Ratio Det.	4.4Ω	3.2ΩCT	114418	17-3497	TV-115	6205	Tertiary winding=. 9Ω
L31	Horiz. Osc.	103Ω		114132	19-1576	TV-163	6210	
L32	RF Choke	1.8Ω		114693	19-1002		4606	2.2 Microhenries; IRC Part No. CLA
L33	RF Choke	1.8Ω		114693	19-1052		4606	2.2 Microhenries; IRC Part # CLA- Note 1.

* Drill-mounting holes.
■ Detune trap.
♦ Parallel with 5.6KΩ resistor.
▲ Disconnect cap. across coils.
† Cut out 7/8" sq. chassis hole and drill mounting holes.
Note 1 Not used in all versions.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	Stromberg-Carlson PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L33	.200A	81Ω	1.9HY	161049	C-2327 ①	C-2974	C-21X	C5040 ①	26C43

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Stromberg Carlson PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1/4A 250V	128003		312.250 (1/4A-3AG)	357001	AGC 1/4	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Stromberg-Carlson PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82	162200	1N82 or 1N82A		UHF Mixer
M3	1N105	162202	1N105	1N60 or 1N64A	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M4	Dial Light	28025	#51, bayonet - 22T models only
M5	Tuner	164037	VHF-21T models
	Tuner	164034	VHF- 22T models
	Tuner	164035	UHF - 22T models
M6	Trap	171838	VHF Ant. Input Filter
M7	Centering Magnet		Part of yoke cover (T5)
M8	Ion Trap	114645	
	Cabinet	108351	Models 21TQ, 22TQ
	Cabinet	108350	Models 21TM, 22TM
	Knob	134225	On/off/volume
	Knob	134234	Contrast
	Knob	134229	Channel Selector, Models 21TQ, 21TM,
	Knob	134224	Channel Selector, Models 22TQ, 22TM
	Knob	134233	VHF Fine tuning - UHF tuning
	Knob	134232	Vertical, Horizontal hold and brightness.
	Dial	122044	UHF - Models 22TQ, 22TM
	Safety Glass	138041	
	Mask	174048	

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
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DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C108, C109, C111, C103, C104, R134, R135, R132 and other associated components.	Check L31, C97, C101, C102, R129, R125, R124 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22 and V23. Check C6, R132, R134 and R135. Check adjustments R9, B2 and B3. Check B+ filter and decoupling network.

BLOOMING

Check by substitution V20, V21, V22 and V23. Check R137, C106, T3, T5A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE (VHF)

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V14. Check video IF components for failure or change of value.

RASTER, NO SOUND, NO PICTURE (UHF)

Substitute V1. Proceed as outlined under "Raster, No Sound, No Picture".

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

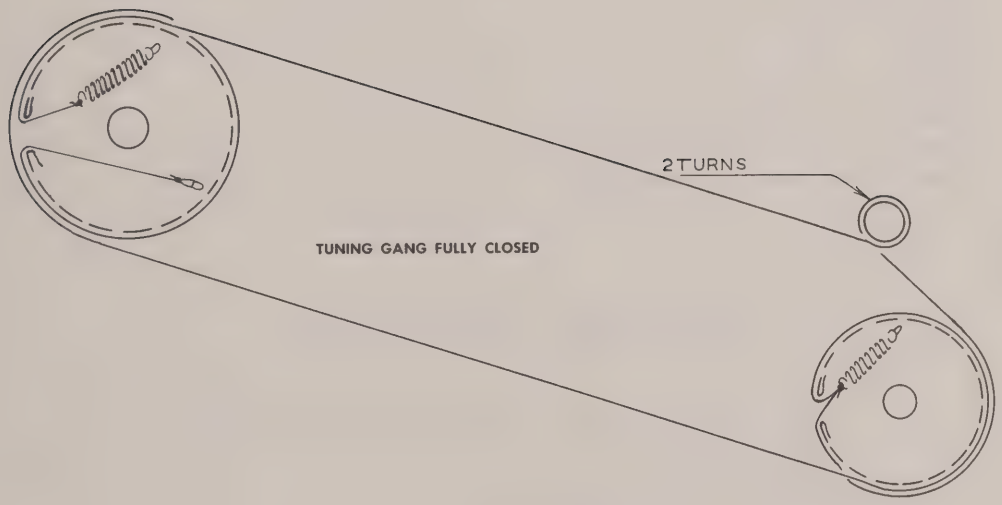
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF DRIVE CORD STRINGING

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet just e aboveot the Channel Selector shaft.

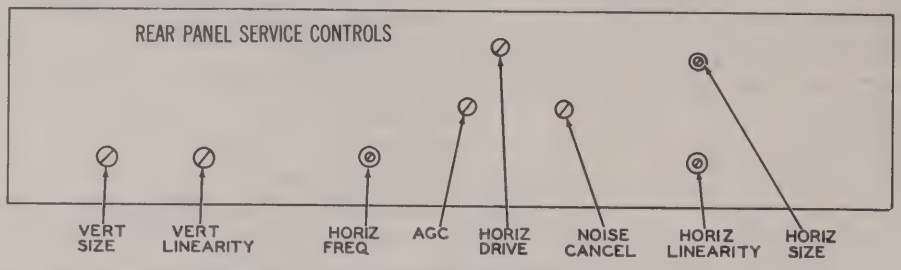
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 3 wood screws holding strips at each side of safety glass. Remove strips and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For removal of picture tube remove safety glass and 2 wing nuts from front tube mount. Remove rear cover and Ion trap. Disconnect CRT socket and HV lead. Remove picture tube.

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - NOISE CANCELLATION CONTROL ADJUSTMENT

All necessary horizontal sweep circuit adjustments should be made before adjustment of noise cancellation control. Tune to the strongest TV signal available. Starting with the control in extreme counter clockwise position, turn control clockwise until the picture starts to distort or lose sync, then back off the control until the picture is stable and undistorted.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. freq. slug L31 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L30) located on top of chassis. (See tube placement chart.)

FUSES

One fuse is used for Horiz. and Vert. Sweep protection. (For location see Tube Placement Chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs, 2 plastic sleeves, and UHF dial from front panel.
2. Disconnect antenna leads.
3. Remove 9 wood screws and 1 metal screw. Remove rear cover.
4. Remove 2 wood screws. Remove antenna bracket.
5. Disconnect speaker leads.
6. Remove 4 chassis bolts, remove chassis.

To remove speaker:

1. Remove chassis.
2. Remove staples holding speaker lead.
3. Remove 4 speaker nuts.
4. Remove speaker

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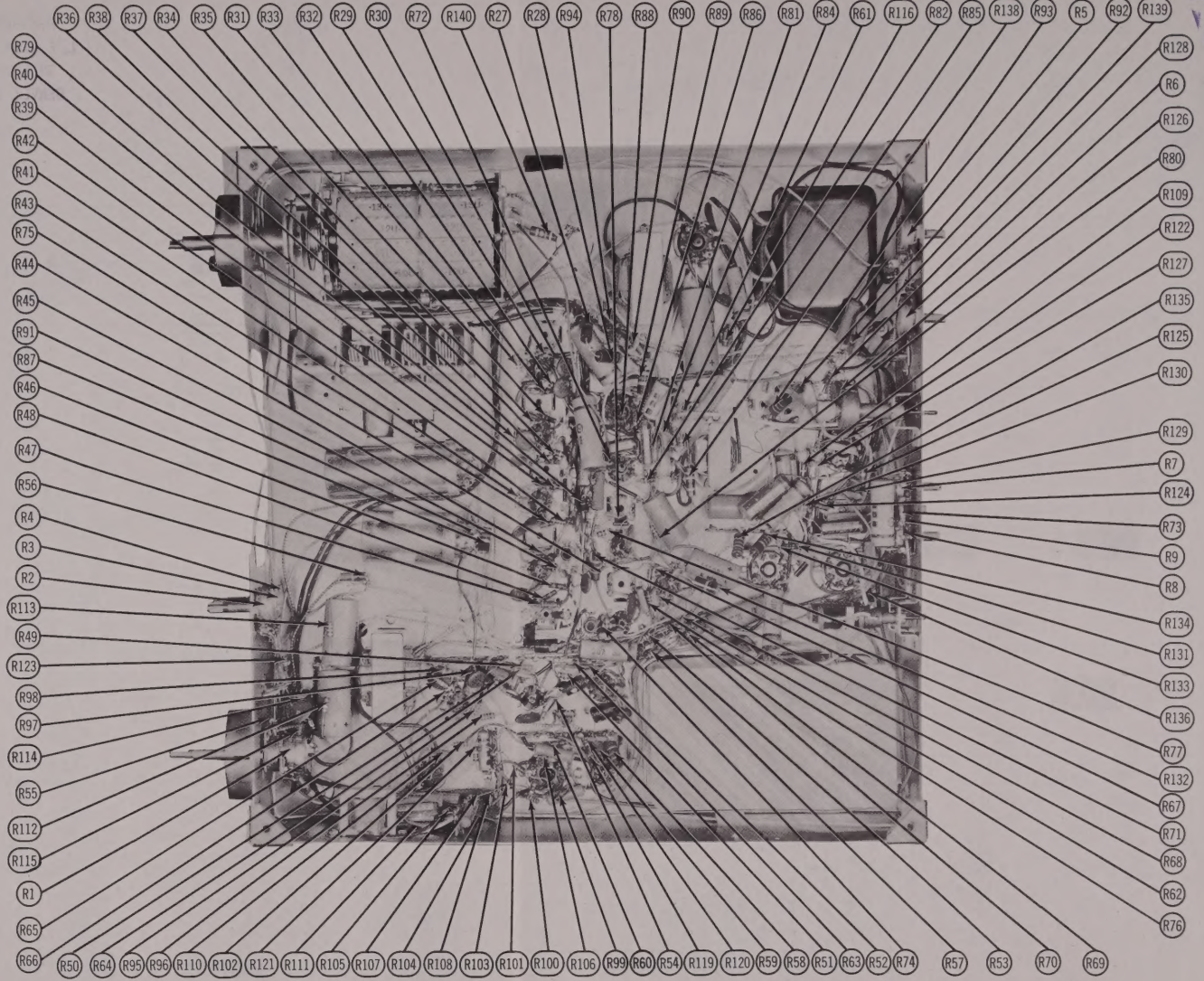
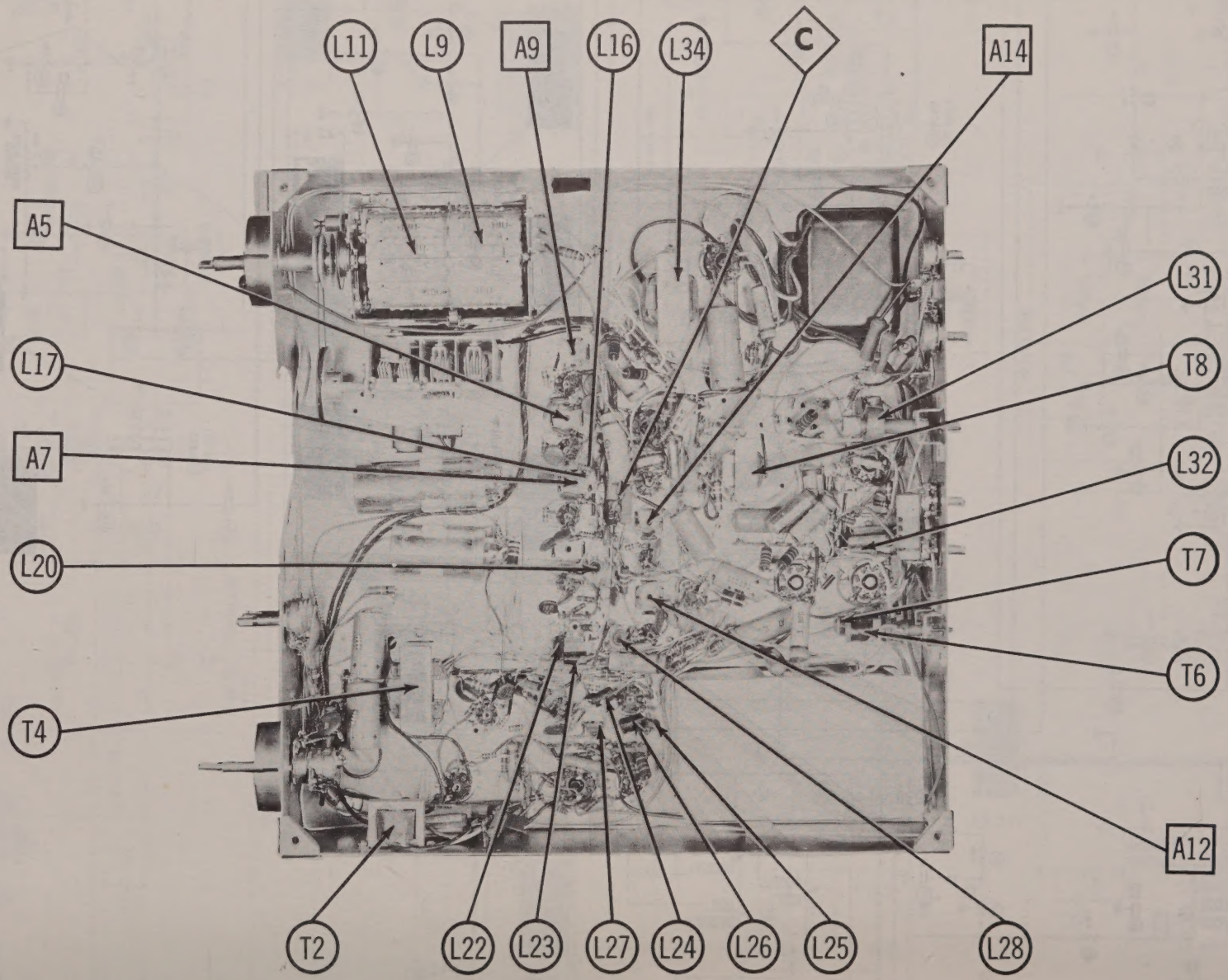


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION